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OUR WILDLIFE NEIGHBORS



IMPORTANT GAME MAMMALS, FUR
BEARERS, UPLAND GAME BIRDS AND FISH
OF
NORTH CAROLINA

By

Lunette Barber, William Hamnett, and Duane Raver

Illustrated by NORTH CAROLINA
WILDLIFE RESOURCES COMMISSION
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THE STATE BIRD

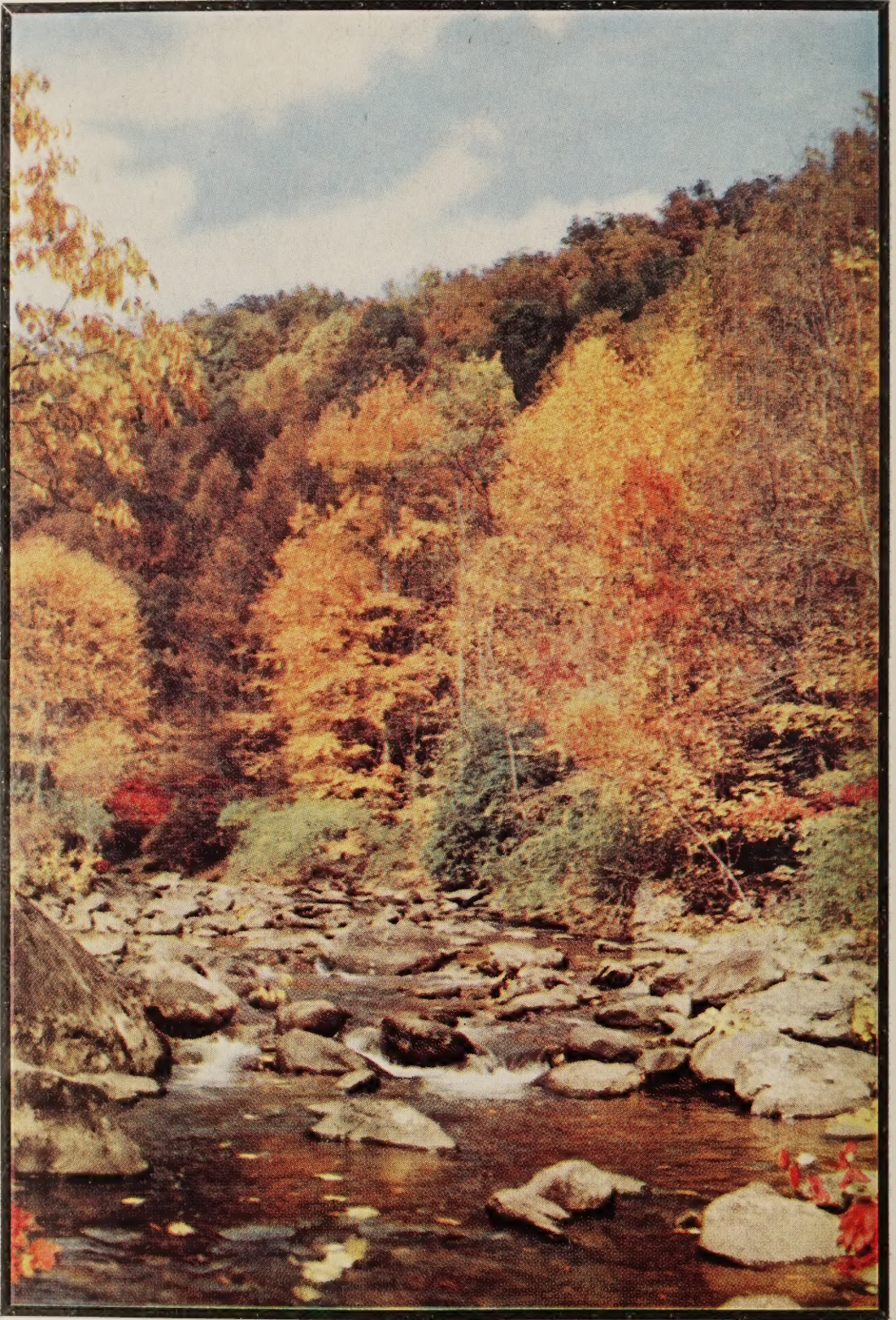
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*Dedicated to the protection and
restoration of our Wildlife Resources
and to the improvement of
hunting and fishing in North Carolina*

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. . . I love thy rocks and rills. Thy woods and templed hills . . .

PREFACE

The purpose of this publication is to give simple, basic information about the important game mammals, fur-bearers, and upland game birds and fish of North Carolina. In response to innumerable requests for this type of information, it is hoped that this publication will serve to answer questions and stimulate interest in wildlife conservation.

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BLACK BEAR

Range: Bears are found chiefly in the mountain and coastal plain areas of North Carolina. The census in 1955 for the state was about 7,300.

Characteristics: The black bear is not a gregarious but a solitary animal, and except for a female with her cubs, it is unusual to see more than one at a time. In the fall when the coat of the bear is at its best, the fur is entirely black except for a brown patch on the muzzle and an occasional white spot on the breast. Its sense of hearing and smell are very keen and enable it to avoid enemies. The least suspicious sound or odor is sufficient to start it from its lair, and requires a skillful hunter to run it down or approach within rifle range. A large black bear may weigh 500 pounds or more, but the average weight is much less. The average adult black bear is about 60 inches in length and stands 30 inches high at the shoulder.

Bears seem clumsy creatures. This is due to their peculiar gait. In the first place, bears are "plantigrade" or flat-footed; the heel of the foot rests on the ground like a man's. In the second place, they move both legs on one side of the body forward at the same time. This gives them a rolling motion. In spite of the apparent clumsiness, the black bear can be extremely fleet-footed when occasion demands, and it takes a special breed of

hound dog to keep up the chase long enough to run him down. Even so, a bear race usually lasts from several hours to two days, and when one is finally cornered it may kill several of the hounds that venture too close. Bears are skillful tree climbers. They especially like to climb up into oak trees, apple trees, and wild cherry trees where they tear off entire limbs and strip them of their fruit.

Habitat: The black bear exists wherever there is extensive forest land to supply suitable food, shelter, and natural protection. The winter quarters may be a cave, the base of a hollow tree, or a den that the bear scoops for itself. Sometimes it covers itself with leaves and grass, leaving only a small air hole.

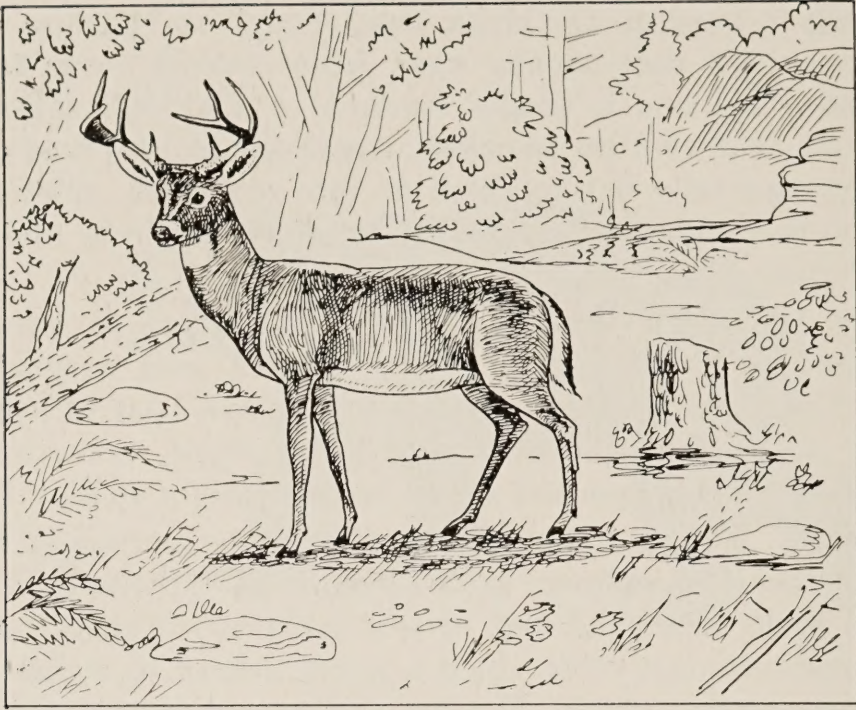
Food Habits: Although omnivorous (eating every type of food), the black bear is inclined to be vegetarian. Primarily it is a root and berry eater, but lack of this preferred food, or hunger, or circumstance, can bring about a rapid change to a meat diet. This is especially true in farming and ranching areas; having found a liking for a meat diet, the black bear occasionally causes losses in cattle, colts, pigs and sheep. A bear kills his prey with sweeps of his mighty forepaws and tearing claws (not by hugging, as is popularly thought). The normal diet covers a wide variety of foods, such as grass, fruit, berries, grubs, insects, fish, and carrion. Bears are very fond of honey.

The Young: The black bear mates in the late spring and early summer. The period of gestation is about seven months, and the cubs are born late in January during the hibernation. The mother in the colder part of the range, sleeps through this natural function and the cubs—blind, helpless, and almost hairless at birth—alternately suckle and sleep during the rest of the hibernation. At birth they weigh about eight ounces, and when they emerge from the den with the mother they average about five pounds. Normally the cubs remain with the mother the first year and den up with her prior to their first winter, but when the new cubs arrive they are driven off, often by force, although it is not unusual to see a mother with two generations of cubs. At no time is the father bear concerned with his offspring, although he usually begets several litters on the same range.

Enemies: Man is the only enemy of the bear in North Carolina.

Uses: Sport primarily, occasionally for food.

Management Needs: Adequate protection and hunting laws.



DEER (WHITE-TAIL)

Range: The white-tail deer is found in most sections of North Carolina, but to a lesser extent in the Piedmont section. In general it is found in all sections where there are extensive wooded areas.

Characteristics: The white-tail normally is a shy, timid animal, given to hiding in thickets and swamps to avoid his enemies. Although often bold during the "rutting" or mating season, the buck is usually more wary than the doe. When startled, he "blows." This is a whistling sound which, in many instances, seems to be an involuntary warning to other deer in the area. He then takes off in a spurt of speed, which has been estimated to be as much as 40 miles per hour. The first rush seems to be a combination of four or five leaps followed by a great, high jump, often covering from 15 to 20 feet. The natural gait is a smooth-paced trot, at a speed ranging from 10 to 20 miles per hour. The white-tail is an excellent swimmer, and like other members of the deer family, the winter coat has air-filled hairs which enable it to ride fairly high in the water. The summer coat is not so bouyant. A deer can swim a steady four miles per hour and has confidence in its ability in the water.

Although the white-tail's vision is far from good, it can pick up a movement at considerable distance. Nature, to atone for the poor vision, has given the deer an excellent and keen sense of smell and hearing.

The deer is not migratory, and most of the traveling is done over a half-mile radius, except that bucks, during the rutting season, often travel more extensively in their search for does. The white-tail is even-hoofed, with a narrow heel and a typical white band above each hoof. The color of both male and female is similar, and normally there are two seasonal variations. The summer coat is a reddish brown and the winter coat is a dull brown with a blue or gray tinge. The buck sheds its antlers each year, usually by late December. The new antlers begin showing in early May, when food is once more abundant, and the excess vitality from eager eating goes into this new bony growth, which in early development is soft and filled with blood. The growing antlers are covered by a soft velvety coat and when fully formed the velvet is rubbed off by scraping on shrubs and small tree trunks. This usually also rubs the bark of these small trees, and these "antler scrapes" are used by hunters as "buck signs."

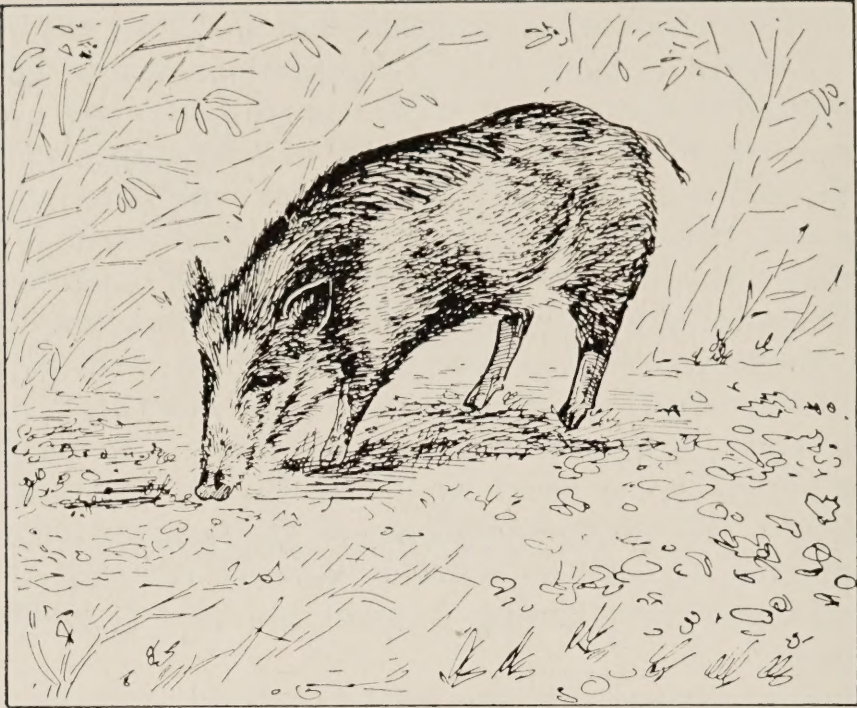
Food Habits: Except for the winter season, and the limitations fixed by a specific range, food is seldom a problem to the white-tail, for it has a goat-like appetite and will eat almost anything that is green. In the summer food includes grasses, leaves of shrubs and trees, roots, twigs, and aquatic plants. In the fall it particularly favors apples and acorns, and with winter seeks out evergreens, with honeysuckle and rhododendron ranking high in choice. The highest rate of mortality occurs in the early spring, when the deer is weakened from the hard winter. When crowded, deer will eat the available food supply then starve rather than move on to a new area.

The Young: The period of gestation of a doe is about 200 days, and the fawn is born in the late spring. The white-tail fawn weighs approximately four pounds at birth, and is endowed with a natural camouflage. The spots, which enable the fawn to merge with sun-dappled leaves, remain about four to five months, and disappear when the first coat is shed about mid-October.

Enemies: The major enemies of the white-tail are stray dogs, wildcats, diseases, parasites, and, of course, man.

Uses: The deer is the sportsmen's favorite big game, so the most important use of it is to furnish sport, recreation, and food for the hunter. Also its aesthetic value cannot be denied.

Management Needs: More legal protection, restocking, provision of good habitat, and research pertaining to life history and diseases.



EUROPEAN WILD BOAR

Range: European wild boar are found in western North Carolina counties and Eastern Tennessee. They like deep-forest country and a minimum of interference from man. In the early part of this century, an Englishman named George Moore leased a large tract of mountain wilderness on Hooper's Bald, a wild and practically impenetrable area, just southwest of the Great Smokies. He had long dreamed of establishing a huge game preserve and enclosed a large timbered tract with a great fence. One day in the year 1910, a group of curious mountaineers from the surrounding country gathered on the mountain top. The sight of heavily bolted crates being transferred to the Bald had stimulated an inquisitive and speculative interest among the natives. Included in the Englishman's menagerie were several wild boar which attracted more attention than any of the other animals released. The spectators stood awed by the beasts as they scrambled into the forest. Thus the opening of the big crates on the mountain top was the beginning of the American history of the wild boar.

Characteristics: The wild boar is ferocious and is considered the most vicious of all mammals that roam the American forest. They have great speed and endurance. These wild boar take the

greatest toll of dogs of any American big game, and the hounds surviving battle carry more scars than hunting dogs in any other part of the country. The wild boar differs from a feral or wild pig in several respects. The legs are longer and shoulders higher. In addition to the coarse long guard hairs which are split at the tips, it has a curly black underfur. When alarmed, it runs with tail straight up.

Habitat: Remote range is suitable for bear. They like mountain "jungles."

Food Habits: In Santeetlah Wildlife Management Area there is a wide variety of food composed of various fruits and mast. Perhaps from necessity, the boar is largely a vegetarian. One of its most common characteristics, however, is a willingness to accept almost anything edible—which includes everything from a chick grouse to fox grapes. The various foods normally available are wild fruits, of which there is a wide variety; namely, mountain grapes, blackberries, huckleberries, dewberries, wild apples and cherries, and other kindred fruits. Included in the menu is green corn from the high-up mountain fields, which has caused many complaints from the ridge farmers. Although the boar is a nocturnal feeder, a sow and her litter—or some solitary boar—are occasionally seen during daylight hours.

The Young: The litter may number anywhere from three to ten, but four or five are most common. Before the litter comes, the sow usually dens up in the recess of a ledge or cliff, or in some high thicket or rhododendron "jungle," almost impenetrable and away from all potential danger. Here she builds a nest by cutting off and carrying leafy twigs and branches.

Enemies: Probably the bear is the boar's worst enemy, and then it is the pig that is the victim. Perhaps stray dogs catch pigs occasionally.

Uses: Sport and recreation.

Management Needs: Adequate protection where now found. The destructive habit of this animal in rooting for food limits the area over which its restoration is recommended by authorities.



RACCOON

Range: Raccoon are found abundantly in Coastal Plain and Piedmont areas of North Carolina, but they are generally distributed throughout the state.

Characteristics: Of all the mammals, the raccoon seems to get the most fun out of life except perhaps the otter. Intelligent, curious, and restless, it looks constantly for something new to do. It is about the size of a small cocker spaniel, the rølypoly body is covered with thick gray-brown fur and a long, bushy tail ringed with black and white. There is a black mask across the eyes, and its narrow muzzle sprouts saucy whiskers. Daytime is bedtime for the raccoon, although a cloudy day may tempt it away from the tree so that you can watch it having fun. They walk and run flat-footed like a bear.

Habitat: The raccoon lives with its family in a hollow high in a tree trunk near a pond or stream. They nearly always wash their food. Sitting on its haunches it holds a frog or other morsel in the front paws, and like a washerwoman dips it into the water to wet it again and again.

Food Habits: The raccoon eats crayfish, oysters, mussels, frogs and turtles. On land they seek out birds, insects, rats, reptiles, corn, grain and fruit.

The Young: In April or May from three to six young are born, and the parents keep them about a year. When they are no larger than kittens, their mother teaches them to claw the bark with their long five-toed feet and to climb down the trunk of the trees. From that moment they adventure and pry and snoop and explore, wanting to know the answers to everything. Only in cold weather, when they hibernate, do raccoons lead quiet lives.

Enemies: Most enemies are to the young—great horned owl, dogs and man, with man of course also hunting the adults.

Uses: Sport and recreation. The fur is used for coats and collars. In some sections raccoons are eaten by man. 'Coon hunting is a very popular sport over most of North Carolina.

Management Needs. In North Carolina the immediate need is to distribute them more evenly over the state, because they have been so numerous in the East that some damage has been done to crops, especially corn. These in the East have been trapped and transplanted into the western counties.

OPOSSUM

Range: The opossum is evenly distributed over the entire state.

Characteristics: The opossum makes its home in a hollow log or tree, or in a snug cleft in the rocks, and lines it with leaves. Sometimes it makes use of a woodchuck's burrow. In winter, it stays home and sleeps through the severe cold, but unlike the bear and the raccoon is not a true hibernator, for though the breathing slows down when dened-up, it maintains a high body temperature. Like the raccoon, but unlike the bear, it dens up for no more than two or three weeks at a time. As soon as the weather moderates a little, it is abroad searching for food. Occasionally opossums are seen out on very cold nights. A peculiar trait is the opossum's trick of feigning death when cornered; of "playing possum." The opossum falls on its side, often with eyes closed and tongue hanging out; if picked up and dropped from not too great a height, it will fall limp, remaining in this condition for some minutes. But the hunter or dog who turns his back, assuming that his prey is dead of heart failure, may turn again to find the opossum gone.

Habitat: The opossum likes woodlands, swamps, marshes—almost any kind of wasteland, but is often found near farms where it sometimes helps itself a little bit too generously.



Food Habits: Like bears and raccoons, they eat practically anything. The contents of opossum stomachs have been found to include insects, small snakes, baby turtles, bats, crabs, and the like, as well as berries and fruit. Apparently this animal has a special weakness for corn in the milk stage, and for persimmons; often a hunt starts at a persimmon tree. They also eat carrion.

The Young: Two broods per year are not unusual in the south, although in northern states one brood only is more likely. The gestation period is only $12\frac{1}{2}$ days. A litter may be gathered in a tablespoon, for at birth a baby opossum is scarcely the size of a honey bee, and 100 babies weigh less than a silver dollar.

The blind, roundmouthed head has a worm-like appearance. The tail is curled under the belly, and the hind limbs are hardly more than bumps. The fore limbs, however, are well developed with strong claws. With a hand-over stroke, the infant pulls itself through its mother's fur into her pouch. There it fastens firmly on a teat, to remain for several weeks. Normally the female has but 13 teats, and when the broods exceed this number, the excess inevitably die. After a month the pouch usually contains no more than seven or eight young. They remain in the pouch for about two months. When they have reached the size of mice they may go exploring over their mother's body, but will scurry back into the pouch at the slightest alarm. After

the second month they travel clinging to the mother's fur. The opossum is the only mammal in the United States that can hang upside down by its tail because it is adapted for seizing or grasping, especially by wrapping around, and is known as "prehensile tail." A female with two rows of passengers on her back with their tails wrapped around the mother's tail appears twice her normal size. The opossum is one of our most prolific mammals.

Enemies: Men and dogs are the opossum's worst enemies, but it is hunted also by owls and by most of the larger predators. They are subject to tularemia or "rabbit fever," which may be transmitted by the wood tick to man and also to sheep. Many opossums are killed on the highway by automobiles and trucks.

Uses: The opossum is hunted for its fur and used for food. It furnishes sport and recreation for many, and is hunted at night since it is nocturnal.

Management Needs: Protection from exploitation.

RABBIT

Range: Rabbits are found in all sections of the state. However, they are found in largest numbers in the Piedmont area and Coastal Plains of North Carolina.

Characteristics: There is a difference between the rabbit and the hare. The wild rabbits are smaller and have shorter ears and shorter hind legs than the hares. The young are born blind and nearly naked. Rabbits and hares resemble rodents, but unlike rodents they possess two small incisors, or cutting teeth, behind the large one in the upper jaw. The distinctive characteristics of the cottontail is, as the name implies, its short bushy tail. It is elevated when he runs and shows white on the underside. The swamp rabbit has a dingy white tail underside. Both sexes of the cottontail are colored alike in brown coats with white undersides. The size of the animal varies according to the food supply of each locale, but it weighs from 2 to 3 pounds and averages about 13 inches in length. Its ears are about 3 inches long.

Habitat: The cottontail prefers the cultivated areas, especially where there are farms and orchards. It usually travels over a network of paths which can be readily detected.

Food Habits: In summer the food is primarily herbs, short shrubs and its favorite clover. Since the rabbit does not hiber-

nate like the woodchuck, it must seek winter food, which is usually the bark and twigs of low trees and shrubs. They are also fond of cabbage, dandelion leaves, and sometimes do much damage to gardens.

The Young: Rabbits are prolific. Usually the life span is shortened by hunters or natural enemies. Breeding begins at about six months and continues at the rate of several litters per year with an average of four young to a litter until the rabbit dies about seven years of age. The gestation period averages 28 days. Young are born during all but a few months. They are born naked and blind in a nest which is built in a depression in the ground. It is often lined with the fur of the mother. The doe suckles her litter, and after a few days they have grown a protective fur and are strong enough to leave the nest in her company. The doe often moves them about by picking them up by the neck as cats do kittens.

Enemies: Their enemies are numerous, and millions are killed each year by hunters and predators. Natural enemies are the owl, fox, brown rat, hawks, and carnivores to which it is the chief food supply. The greatest and least-mentioned enemy is the common house cat, which is a skilled and stealthy stalker, usually prowling through the woods at night. Self-hunting dogs are also bitter enemies. Despite all their foes, they are usually able to hold their own because they are so prolific. *Tularemia* is a disease found in rabbits which can be transmitted to man through cuts in the skin.

Uses: The rabbit is used for meat. About 5½ million pounds are taken annually in North Carolina. Also the rabbit is used for felt and fur, besides sport and recreation. Modern methods of preparing fur have stimulated successful shearing and dyeing of rabbit fur ("coney") to the likeness of beaver, ermine, chinchilla, and others. A very wide variety of expensive sounding furs are really only rabbit. Much felt is used for making hats.

Management Needs: Adequate protection and habitat improvement. What can be done for the quail will also benefit the rabbit in habitat improvement. Multiflora rose hedges are especially beneficial since they provide protection from enemies. Young rose plants to make hedges are available free of charge upon application from the North Carolina Wildlife Resources Commission, Raleigh, North Carolina.



The rabbit furnishes more meat to North Carolina tables than any other game mammal.



SQUIRREL

Range: Gray squirrels are found throughout the state. They like the dense woods and heavy forest areas. It was the woodman's axe rather than his rifle which has most effectively decreased the squirrel population. Some fox squirrels are found in the Sandhills and other areas of North Carolina. They prefer the pine woods and the edges of woods near farms.

Characteristics: Somewhat smaller than his cousin, the fox squirrel, the common gray squirrel weighs about one pound and measures 19 inches long, of which about 9 inches are tail. The general color is a pepper-and-salt gray. The under fur is lead colored and the longer guard hairs are often tan near the base, black in the center, and white-tipped. On the top of the head, back, legs and saddle the gray is tinged with brownish-yellow. On most specimens the cheeks, muzzle, ears, and upper parts of the paws are a clear tan. The chin, throat, underside of legs, and under parts are white, or nearly so. The long tail hairs, like those of the body, end in white and give the tail a silvery appearance. In winter the tan markings are less apparent; the fur is longer and more silvery gray.

Habitat: Gray squirrels prefer dense woods and oak forest areas. They are especially abundant in the hardwood swamps of the east and the extensive oak forests of the rest of the state.

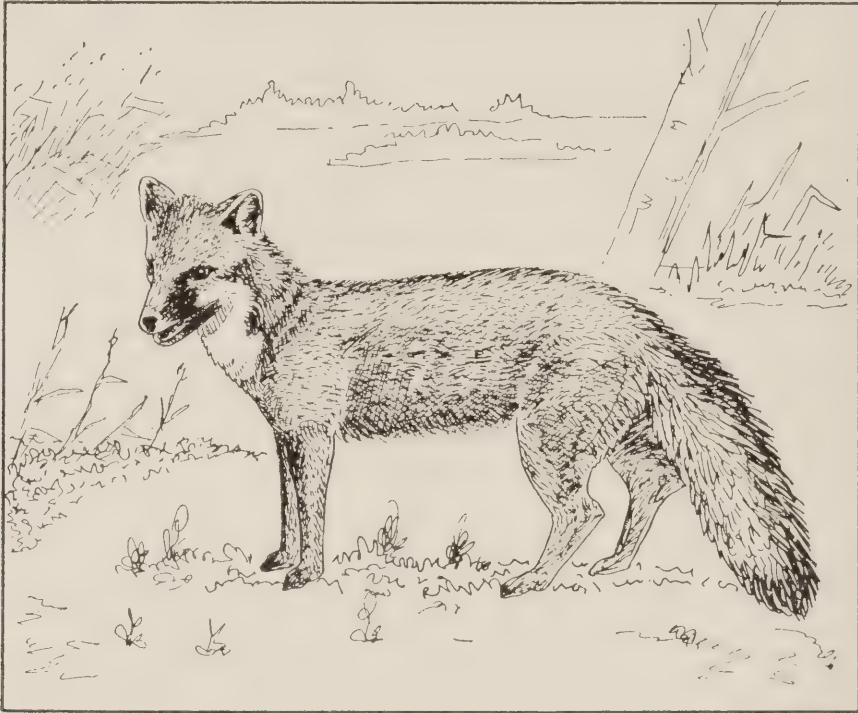
Food Habits: For the most part the diet is strictly vegetarian. Gray squirrels are particularly fond of nuts and these are a staple food item. Acorns from both the red and white oaks, hickory nuts, butternuts, and beechnuts make up the bulk of the diet and these are supplemented by seeds of various kinds. In the spring squirrels eat the buds of the maple, elm, and other trees. They are also fond of sap and will gnaw through the bark of trees to get the sweet liquid. The gray squirrel also consumes much water and will drink several times a day when it is available. The seeds of the longleaf pine form an important diet item for the fox squirrels of the Sandhills area. Each autumn it gathers and hides large quantities of nuts and acorns. They usually do not store caches of food in any one place. At times one may hide a handful of nuts or acorns in a hollow limb or tree, but usually it plants them singly in the ground or hides them haphazardly in the rough bark of a tree trunk. Thus the squirrel unconsciously aids nature in reforestation because they never find all they bury. Sometimes squirrels migrate in great numbers because of fires, timber cutting and periodic mast (nuts collectively, especially for animals) failures.

The Young: The mating season is in the early spring. Gestation period averages 44 days. Generally from two to four are born; more rarely a litter may be from one to six. Baby squirrels are blind at birth and remain so for about five weeks. The tiny bodies are hairless, without ears, and have only rudimentary tags for limbs. They first emerge from the nest at the end of six weeks, and by the eighth or ninth week they begin to take regular food such as buds, leaves, and fruit. They become fully adult in 12 months. The possible life span is estimated to be 15 years.

Enemies: The squirrels' enemies are numerous and only their watchfulness and agility have enabled them to survive. The larger hawks, the great horned owl, and the barred owl include the winged threats; the weasel, mink, red fox, gray fox, and bobcat all prey upon them. Each must ever be on the alert, whether aloft or aground. The botfly warble is also an enemy of the squirrel. These grubs are most numerous during the late summer and for this reason the hunting season is usually set so as to begin after most of the grubs have dropped out of the squirrels' body.

Uses: The gray squirrel and fox squirrel are used for food, sport and recreation. They are also enjoyed because of their aesthetic value.

Management Needs: Adequate protection and elimination of wood fires. Installation of den boxes where hollow trees are missing is necessary. Reservation of den trees in the course of timbering operations is also very important.



FOXES

Range: The red and gray foxes range throughout the state. The red fox is native only to the western part, but has been introduced to other sections of the state where it is now becoming common.

Characteristics: The gray fox is a grizzled gray on its upper parts, mixed with buffy to light red; the under parts are white to ashy-gray, and the tip of the tail is dark gray. The red fox ranges from a yellowish red to bright brick red and the tip of the tail is white.

In weight the gray fox ranges between 7 to 11 pounds, generally averaging about 8. The gray fox is just as shy as the red, and in many ways is just as cunning, but judging from the antics of trapped or bayed red and gray foxes, the gray fox puts forth a

greater fight for its life. The gray fox uses a den. This, however, is seldom a burrow, though occasionally it may be in the hollow of a decayed tree; the oak is one of its favorites. It prefers, where possible, a rocky habitat for denning often among large boulders that form rugged slopes.

Habitat: Foxes establish runways over areas in which they live. They thrive in close proximity to dense human populations but are also common to areas remote from habitation. In fact there is probably no place in the state where they cannot and do not set up housekeeping if unmolested.

Food Habits: Like the red fox, the gray is omnivorous in its food habits; all the wild berries which grow in its habitat, all the small rodents, particularly field mice, rabbits, woodchucks, every bird it can catch, including all of the domestic fowls; snakes, shrimps, clams, crayfish, grasshoppers, frogs, fish, young turtles, field corn, nuts, acorns, melons, and grapes of the vineyard. At times the gray fox can be a real menace to newly born lambs and pigs.

The Young: The young number from two to five. The male fox assists in feeding the young, beginning at the time they appear at the den's entrance when approximately one and one-half months old. The food consists of small rodents and other typical fox food that the parents gather in their forays and pack to the den's entrance for the young cubs to feed upon.

Enemies: Diseases and parasites are enemies of the fox. Often when foxes become overly abundant they are reduced in numbers by rabies, distemper, or other diseases. Fox hunters take a small toll.

Uses: Sport and recreation. Fur is of little value now.

Management Needs: Keeping the number of foxes in balance with its habitat is the most important management need.



BOBCAT

Range: In North Carolina bobcats are found mostly in the mountain counties and in swamplands of the coastal plains. Occasionally they are found in localities between.

Characteristics: The bobcat may be described as an over-sized housecat with a stubby tail and tufted ears. They are brownish tan with dark spots. The head looks large because the hair on the cheeks and chin is somewhat tufted. Bobcats average about 20 to 25 pounds. They are nocturnal, and are rarely seen during the day. It is ferocious, and will even challenge a wild boar to capture a suckling pig. On the other hand they will purr like a kitten and show signs of happiness when pleased or content.

Food Habits: The bobcat will take young pigs, lambs and new born calves. They like very much to prey on fawns and even full-grown deer are taken by them during shortage of other prey. Perhaps the most common diet is the rabbit. They will also eat any rodent in their range. Quail, grouse, and wild turkey are not overlooked by them. Since they are nocturnal perhaps they take more mammals than birds.

The Young: The babies may open their eyes a few days after birth to find a home high up in a hollow tree, in a cave, or in a hollow log on the ground. It will be lined with soft leaves, moss,

or other comfortable bedding. Usually there are three kittens in a litter and they are taken care of much like a housecat takes care of her kittens.

Enemies: The bobcat has practically no enemies. "We take care of our own" seems to be a good slogan for them too.

Uses: The fur is of no particular value. The pelts may be tanned for trophies, perhaps rugs mostly.

Management Needs: They are the only predators in the state which are considered seriously enough to be actively controlled. Nowhere are they protected by law.



WOODCHUCK (GROUND HOG)

Range: The woodchuck is found almost entirely in mountain and western Piedmont counties. They are rather numerous along the Blue Ridge Parkway.

Characteristics: Woodchucks are actually large ground squirrels, and are the only member of the ground squirrel group found in the state. They are fairly large; often they weigh 12 pounds. They are rodents with sharp chisel like teeth and possess skill in gnawing. Usually we think of the squirrel as a creature that chirps. The woodchuck is gifted with the ability to whistle.

The male and female are colored alike, being a brownish-gray with black feet.

Den digging is a specialty with them. Since they are extremely clean in all their habits, they seldom use their den the second year, thus it makes a home for other den-lovers.

Food Habits: They are vegetarians, preferring crops for food especially garden vegetables. Sometimes they climb trees for their choice fruit, nuts or berries.

The Young: Woodchucks like to live alone as much as possible. From 4 to 6 are born late in March or April. They are blind and almost helpless at birth, and remain in the den nest for several weeks. The father does not assist in rearing the young.

Enemies: They have few enemies except man and dogs. Constantly on the lookout, their size, and courage help to save them. Foxes and bears sometime outwit them. Diseases and parasites are almost unknown to them, perhaps because of their cleanliness.

Uses: It is neither a game nor furbearer or taken for food, but is important for building dens for other small animals.

Management Needs: Unless their damage becomes too great, they should be recognized for building homes for other animals.



Smallmouth Bass

The smallmouth bass prefers the cool, clean water of our western streams and rivers. In those lakes where it is found, water temperature tends to define its range.

FISH OF NORTH CAROLINA INLAND WATERS

By Duane Raver

Introduction :

Less is known by the average individual about fish than any other of our wildlife resources. Yet the interest in fish is generally high among people from all walks of life. In order to manage, conserve or even enjoy fish, one must first at least be aware of the characteristics, habits, habitats and distinguishing features of the common fish found in North Carolina inland waters.

Much can be learned about fish as a group, and further, a great deal about them as individuals. The general biology of fish is fairly well known and can be readily found in most zoology or biology texts. Therefore, only brief mention will be made of the better known facts about fish. Lesser known data regarding the fishes' peculiarities will be outlined, which may be of interest. The entire section on fish will serve only to stimulate continued interest in fish, inform the reader concerning fish groups, present data on fish identification and suggest study outlines and procedure which may be helpful in teaching others about fish.

What Do Fish Need To Live?

Brook trout will not live in Piedmont farm ponds, and largemouth bass are not at home in small mountain streams. Yet, both habitats contain water, food and cover. This points up the important fact that different species of fish often have widely different requirements for life. Trout, for example, must have much more dissolved oxygen in the water than some other groups of fishes need. Also, the trout family requires water temperatures much colder than most other fish. The amount of oxygen in the water and the temperature of the water very often decide where certain species of fish will exist. This is to say that various fish need varying habitat requirements.

Oxygen is used by fish in much the same manner as it is used by mammals. The manner in which the fish acquire the oxygen is different, of course, since they must take the dissolved oxygen from water while mammals filter out the oxygen from the atmosphere. Gills are used for the transfer of gases in fish, while lungs accomplish this in mammals. Carbon dioxide, a by-product of metabolism, is removed from the system as the other part of



Largemouth Bass

The largemouth bass is the most widely distributed bass of our State. This is the fish generally used in stocking the myriads of farm ponds we now have. Practically all of our lakes, ponds, rivers and sounds in North Carolina support the largemouth bass.

this transfer. The balance of these two gases, oxygen and carbon dioxide in the water is very important to the well being of the fish.

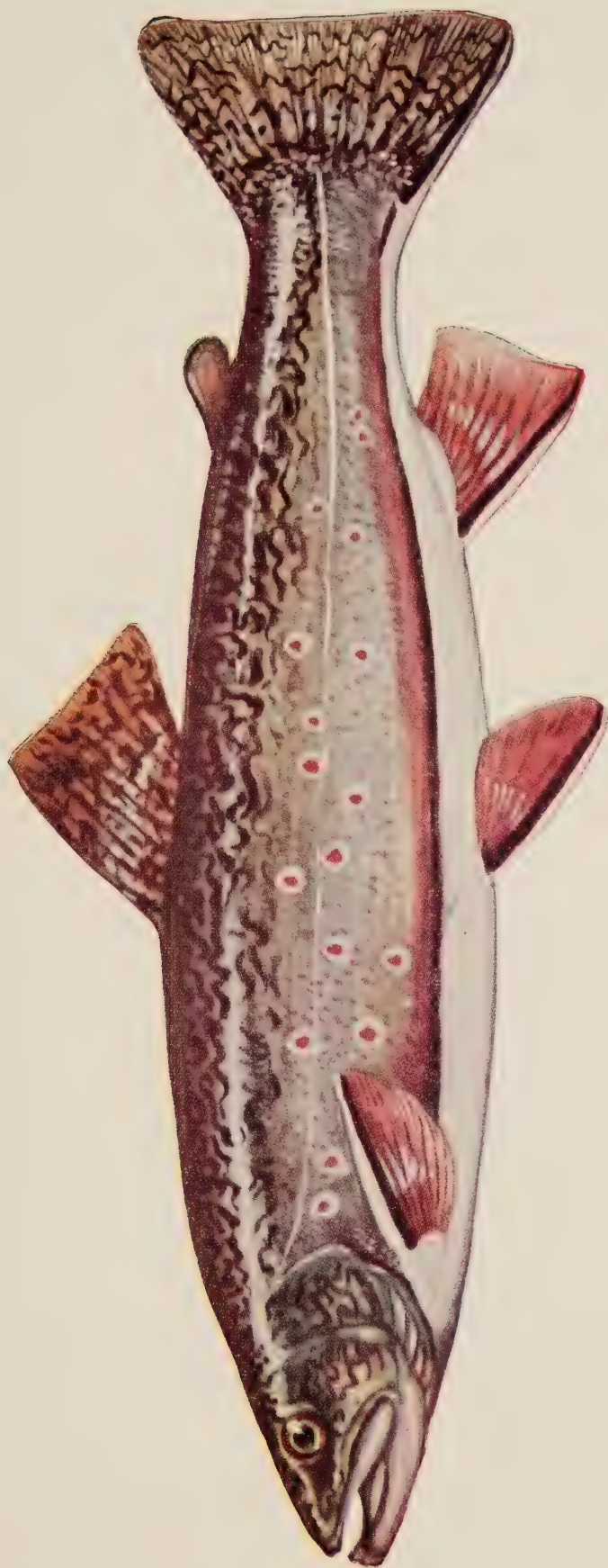
Fish seek the water temperatures that seem the most comfortable to them, just as mammals look for cool places in summer and warmer locations in winter. Fish are termed "cold-blooded" since they have no temperature regulatory devices and must assume the temperature of their surroundings. This means that if the water around them is 80°F. or 40°F. then the fishes's bodies are about these temperatures too. Sudden changes of water temperature, as for example, which might occur when fish are taken from hatchery ponds of 75°F and placed in a stream of 62°F, may kill the fish. This temperature factor often locates the fish at varying depths of water. That is, in the middle of the summer with surface water temperature at 90°F, bass will often go as deep as 50 feet to find the preferred 70° F temperature. In winter, with water temperature generally at 40°F to 50°F, fish are practically inactive. Their heart beat is slower, they need less oxygen and almost no food. The rate of metabolism is much lower. They are quiet and move very little during the winter months.

Water temperatures influence directly the times at which fish spawn. When water warms in the spring, many fish become active again and begin spawning activities when the critical temperature is reached. Should the water temperature fall suddenly, spawning is temporarily postponed.

Food supplies for fish often mean the difference between good growth with fine fishing or slow growth and poor fishing. Overcrowding, created by too many fish, results in stunted fish and only small ones are caught. Thus, fish populations must be managed carefully, and an annual harvest made to thin out the crop of fish. If the food supply is good and the fish population balanced, an acre of water in a farm pond can produce 250 pounds of useable fish every year. However, without adequate food, practically no useable fish will be produced, and only small ones will be found in the pond. Commercial fertilizers are often used to produce microscopic plants which start the food chain and provide food for the fish.

BLACK BASS

Range: The smallmouth bass has the most restricted range and is seldom found east of a line from Reidsville to Shelby. The



Brook Trout

The brook trout is the only native trout of North Carolina. Of the three trout found in the western counties, this one prefers colder water and therefore is found nearer the headwaters of streams and rivers.

largemouth bass is found throughout the state in a variety of lakes, ponds, and rivers.

Characteristics: The dark lateral band on the side of the largemouth will usually identify it. This species has larger scales than does the smallmouth, and the upper jaw extends back of the eye with the mouth closed in the largemouth. The smallmouth bass has vertical bars on its side and a smaller mouth, with the upper jaw extending only to the middle of the eye. The general color of both basses is about the same, varying from greenish silver, through olive and bronze to deep blackish green in dark waters.

A ten-pound largemouth is a large one with the average weight below four pounds. The smallmouth seldom goes over 8 pounds with a three pounder being a good-size fish.

Habitat: Although these two fish are often found in the same lake or river, the smallmouth prefers colder, clearer water of streams and the deeper lakes. Ponds, lakes, and rivers of warmer and more sluggish waters are preferred by the largemouth. Both like to hunt food among weed beds and underwater brush although this cover is not necessary for their well being.

Food Habits: A rather long list of bass foods would include: minnows, young bluegills, and other sunfish, frogs, crayfish, insects, insect larvae, and tadpoles.

Life History: Both smallmouth and largemouth bass spawn in the spring. Although the smallmouth usually builds its nest at a cooler water temperature than does the largemouth; 62°F will usually find both species at work. The nest of the smallmouth is almost always constructed in sand or gravel in water from 2 to 8 feet deep. The nest of the largemouth may be placed on sand, mud or even on submerged vegetation. Usually the nests are round and from 18 inches to 42 inches in diameter. Many bass (always the male) build neat spawning nests and spend days in excavating and clearing the area. The actual egg laying may take an hour or spread over a day or two. The eggs hatch in from 5 to 10 days depending on water temperatures during incubation. Smallmouth fry tend to disperse relatively soon while the newly hatched largemouth fry will stay in a close group protected by the parent bass for several days or weeks.

Bass grow rapidly if food is readily available and may reach 9 to 10 inches by the fall of their first year. Small insects are eaten at first but minnow fry and tiny bluegills are soon taken by the small bass.



Rainbow Trout

Four times more rainbow trout are stocked from state fish hatcheries into our western streams than either brook or brown trout. The rainbow trout is most generally distributed in our streams and supports the majority of our trout fishing.

MOUNTAIN TROUT

Range: Although the brook trout has the most restricted range of the three, all are generally found in the mountain streams of western North Carolina. Few trout are found east of a line from Mt. Airy to Forest City.

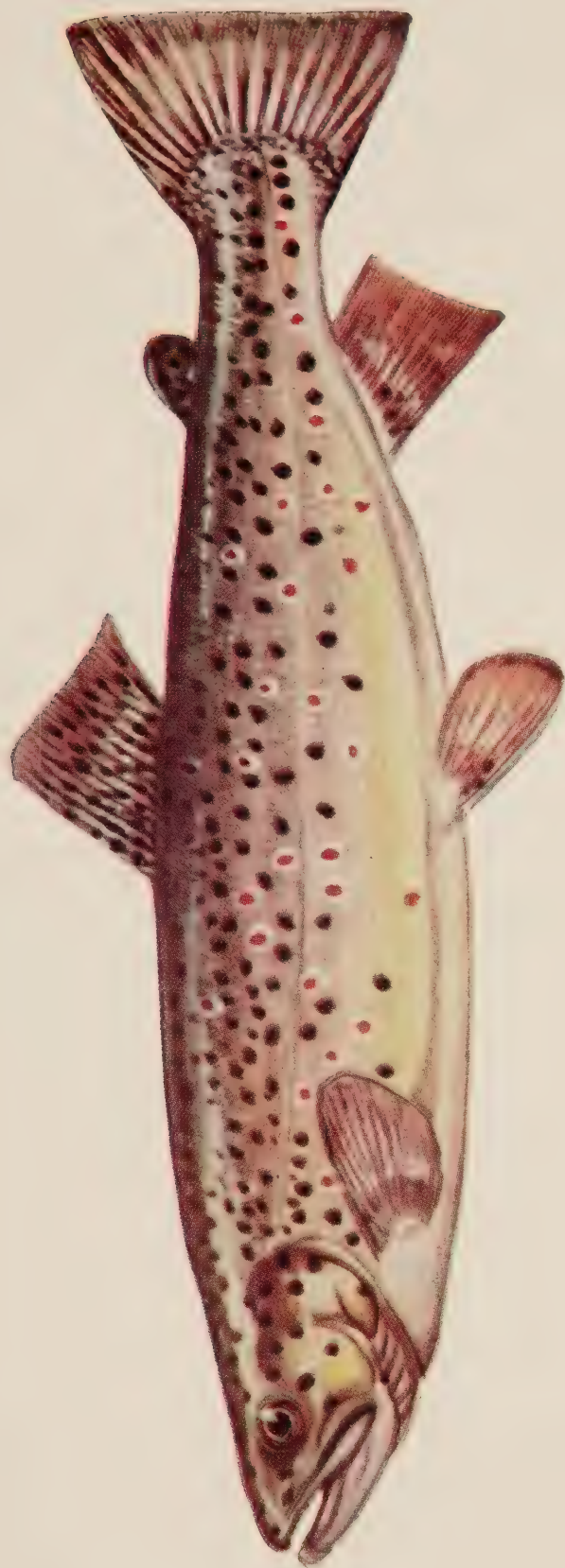
Characteristics: The trout are extremely streamlined in body style and are good swimmers. The brook trout can be identified by the worm-like markings on its back, and by its white edged fins. The spots on the rainbow are *not* encircled by light “halos” and its side is usually pink or red. The brown trout is generally an olive or chocolate brown to yellowing color with round spots, mostly above the lateral line. In North Carolina the brown trout probably attains the largest size, and three to five pounders are caught every year with twelve pounds about tops. Large rainbows from nine to twelve pounds have been reported, but the average is about a pound. Two pounds would be large for the brook trout and four almost tops in North Carolina, although 8 to 10 pounders are caught in Canada.

All three trout are usually highly colored and are among the most beautiful of fishes. Their tiny scales (almost invisible on small brook trout) reflect light in a flashing manner, yet the trout can become completely hidden in the shadows of a shaded stream.

Habitat: The trout inhabit lakes only occasionally although in those very cold, deep, clear lakes that are satisfactory for them, they grow quite large. The usual habitat of the trout is a swift running, cold, stream. They require gravel beds on which to spawn. Even a small stream will often carry brook or rainbow trout in surprising numbers. However, if pollutants are allowed access to the stream, trout will soon disappear. This has caused a serious decline in the amount of trout habitat in North Carolina. Trout often compete successfully with smallmouth bass, suckers, and a few other species. All three trout species are often found together in the same stream.

Food Habits: In many North Carolina streams the trout eat more land insects which alight in the water than is ordinarily thought. These terrestrial insects may make up 50 per cent of the trout's diet. Aquatic insect larvae are taken in large numbers also, as are crayfish, minnows, and even young trout.

Life History: Trout may spawn in very late fall or early spring



Brown Trout

The brown trout can exist under marginal habitat conditions. It sometimes is found associated with smallmouth bass at the downstream limits of trout waters.

along gravel bars, depending on the individual species, where the stream flow is somewhat retarded. The eggs are deposited in small depressions between rocks or gravel and settle to the bottom and are covered with gravel. They are constantly washed by the stream current and hatch according to the temperature of the water. It may require 3 months in 35°F to 40°F water, or slightly over a month at 50°F, or as little as two weeks at 60°F. Brook trout which spawn during November at 37°F, and rainbow which spawn during February at 40°F will have their eggs hatch on almost the same date because of the warmer temperatures beginning in March. Brown trout fry seem to grow the slowest, rainbows the most rapid. Rainbows may reach 7 inches late in the fall of their first year.

Many streams have good natural reproduction and these produce many native trout. However, most streams need stocking to maintain good fish populations. Many thousands of trout are reared annually in State Fish Hatcheries for release in public waters.

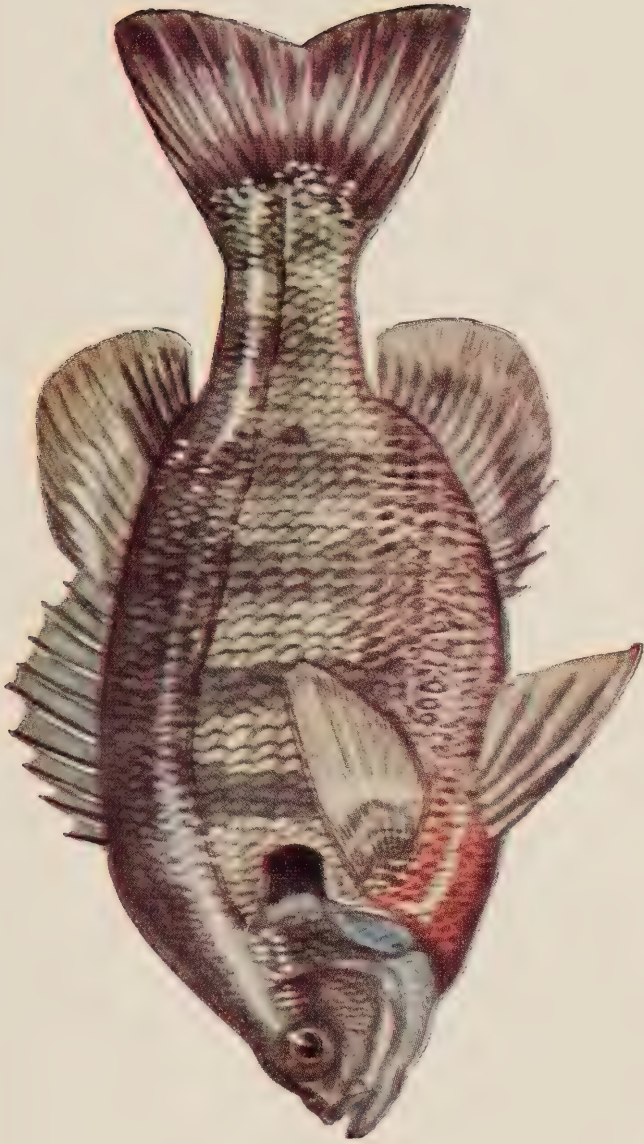
PANFISH

Range: The panfish are very widely distributed and there are very few lakes and ponds in North Carolina that do not contain one or more of them. The robin seems to thrive better in rivers of the Coastal Plain, but is found throughout the state. Bluegills prefer small ponds and lakes but have been widely introduced in creeks and rivers also. Crappies do best in large lakes.

Characteristics: The dark spot on the trailing edge of the soft dorsal fin will identify the bluegill. Color varies greatly and some bluegill, from dark, cypress waters, may be almost black, while others from shallow, sandy ponds will be silvery with light vertical bars. Males tend to be darker than females. Eight-ounce fish are common and twenty ounces are big ones.

The robin has a moderately large mouth, larger scales and a long, narrow "ear flap." The under portions are often deep orange and the robin is sometimes called "red-breast." The back is usually dark olive and the sides have a bluish tinge. In young robin the blue, wavy lines along the cheek are often more characteristic than the long ear flap. The robin usually weighs less than 1 pound.

The name speckled perch, although incorrect, describes the crappie quite well from the color pattern standpoint. The dark-



Bluegill

Bluegills are the companion fish to the largemouth bass when farm ponds and lakes are stocked. In rivers this fish is found in the pools and slower moving water.

black blotches have no definite pattern over the silvery or yellow-green side of the black crappie. Those markings are in broken vertical bars in the white crappie which has 5 to 6 dorsal spines. There are 7 or 8 spines in the black crappie dorsal fin. Crappies weighing three or four pounds have been reported, but those weighing more than a pound are good ones.

The little pumpkinseed or common sunfish is a brilliantly colored fish although rarely reaches much over 8 ounces. Its body shape is quite similar to that of the bluegill and it is sometimes mistaken for this fish. The pumpkinseed has a bright red border on the ear flap and usually is a shiny yellow on the under portion of its body. The sides are speckled with olive and blue-green.

Habitat: All the panfish mentioned are primarily pond and lake fish except the robin which prefers the rivers of the Coastal Plains. None do well in rapidly flowing streams and are at home around brush and weed beds in the farm ponds and lakes over the entire state.

Food Habits: Because of their small mouths, the bluegills and pumpkinseeds feed primarily on insects and their larvae. Tiny minnows and fry are also taken as well as snails and even their own young. Robin and crappies take small minnows, crayfish and some aquatic insects.

Life History: The bluegills, pumpkinseed and robin build small, circular nests in groups in shallow water from very early spring until late fall. Many large adults spawn twice during the year. The crappies may or may not build nests and often spawn over brush or submerged vegetation. Most of the panfish are very prolific and lay from 5,000 to 10,000 eggs at each spawning. The tiny fry stay in schools among the protective shoreline weeds for several weeks. With adequate food, the young grow rapidly and bluegills may reach five inches by the fall of their first year. If food is insufficient, the young become stunted and may not attain a useable size for four or five years.

ROUGH FISH

The list of fish classified as non-game or rough fish would include: the hog sucker, chub sucker, red-horse sucker, channel catfish, white catfish, brown bullhead, yellow bullhead and bowfin. These fish are either competitors with the game fish or predators upon them and are, for the most part, undesirable. Some,

such as the catfishes, are good food fishes and should be harvested and used as such. In some waters of the state, the fishes in the roughfish category are a decided nuisance and may be damaging the game fish populations.

Questions Often Asked About Fish

1. WHAT IS THE LARGEST FRESH-WATER FISH?

The sturgeon. Russian scientists report specimens weighing more than a ton. A white sturgeon caught in an Oregon river weighed more than 1200 pounds.

2. WHAT FISH IS THE SMALLEST?

The goby, which lives in certain inland lakes in the Philippine Islands. Full-grown measure less than half an inch in length, and it requires as many as 15,000 to weigh a pound. They are harvested by the natives and sold for baking into fish cakes.

3. HOW LONG DOES A FISH LIVE?

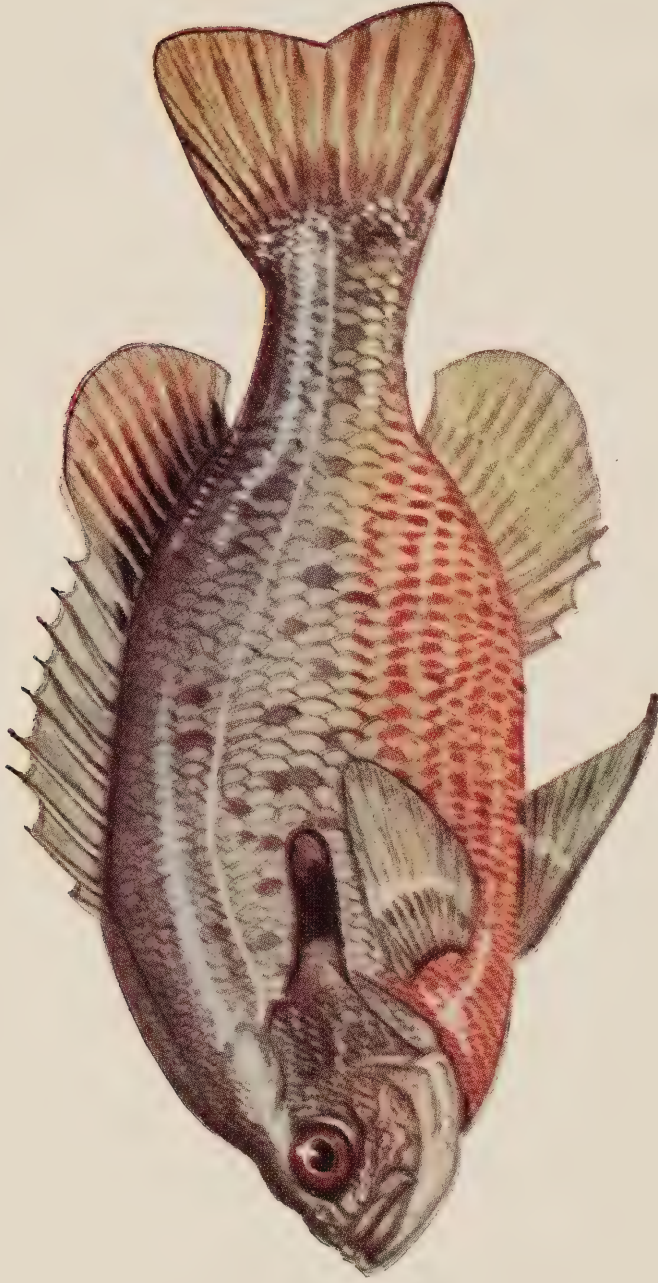
In the wild state, few living things die of old age. As they begin to wear down with age, they are no longer capable of fighting off predators or of competing for food and space with younger members of the same species. An age of 10-15 years is no doubt "ancient" for fish in the wild state, but there have been reports (unreliable ones) of carp which have reached the ripe old age of 100 or even 150 years. Sturgeon are believed to mature at about 20 years of age and may live to 100 years or older. Quite in contrast, some of the smallest fish, such as the goby, are short-lived. One species lives its whole life span in one year.

4. HOW DOES A FISH CHANGE ITS COLOR?

A fish's color is determined by the presence of pigment cells (called chromatophores) in one of the layers of the skin. The color is changed when this pigment is concentrated or dispersed throughout the cells. The chalky-white color or iridescence of fish is caused by crystals (called guanin) which occur in the cells.

5. CAN FISH HEAR?

Yes. A fish has no external ears, hence any sound which the fish detects must be picked up somehow through its body. In some fish, the air bladder is connected by a series of bones to the ear capsules and is believed to act as a resonant chamber for vibrations. Also, experiments have demonstrated that the lateral line records low-vibration frequencies and may in this manner be considered a sort of hearing organ.



Robin

The robin, unlike the bluegill, prefers the swifter flowing water of rivers and streams. In lakes this fish is usually found where swift water flows in, and below the spillway of the dam.

6. CAN FISH SEE UNDER WATER?

Yes. Their vision is limited only by the short distance which light rays can travel under water. Thus, fish's eyes are generally set for nearsighted vision, but they can obviously see well enough to avoid danger and to procure food. Sharks are an exception in that they are farsighted.

7. CAN FISH DISTINGUISH COLORS?

Experiments show that fish can distinguish easily between widely separated colors, and many are capable of discriminating between closely related colors.

8. CAN FISH SMELL?

Yes. A fish's nostrils open to blind sacs lined with sense organs of smell. These are better developed in some species than in others.

9. CAN FISH MAKE SOUNDS?

Yes—at least some species. Some “grunt” by forcing air from their air bladder out through their mouths; others by gnashing the teeth located in their pharynx, the air bladder serving as a resonance box. Some species vibrate their gill covers against the sides of their heads or have special muscles which vibrate as the fish moves, the sound being amplified by the air bladder.

10. DO FISH SLEEP?

Yes. Since fish have no eyelids, they seldom appear to be sleeping, but observations reveal that they do rest regularly. Some lie on their sides on the bottom; some rest against objects; and some merely remain motionless while suspended in the water. Many schooling fish disperse at night to rest and then reassemble the following morning.

11. DOES A FISH FEEL PAIN?

No—at least not in the sense that you would experience pain if a hook were run through your mouth. Biologists tell us that the fish's nervous system is poorly developed and organized and that evidence seems to indicate that a hooked fish experiences discomfort rather than actual pain.

12. DOES A FISH DRINK WATER?

The only water which a fresh-water fish takes into its stomach is that which accompanies its food. The idea that a fish drinks water comes from the “gulping” of water which a fish does as it breathes—the “taking in” of water through its mouth



Black Crappie

The crappie is more suitable for lake and reservoir use and is not recommended for small ponds. Its food is primarily small fish.

cavity and the “expelling” of water through its gill openings. Salt-water fish do “drink” water. Since the water in which they live tends to draw the less salty body fluids out of the fish; they take in water more constantly and excrete the salt *through special cells in their gills*.

13. WHY DOES A FISH JUMP?

There are a number of reasons why a fish jumps: to escape an enemy, to hurdle barriers (example—salmon on waterfalls) to rid itself of bothersome hooks or external parasites, to capture food, and, at times, to play. Tarpon and salmon are the best known jumpers, and they have been known to leap as high as ten feet.

14. HOW FAST CAN A FISH SWIM?

Speeds of fish are recorded by a number of devices—by “fish-o-meters” attached to rods, by stop-watches, by thin lines attached to harnessed fish (the amount of line pulled from a reel in a given time measure), by films, by comparison to other moving objects, etc. Not all fish have been clocked, but the swordfish can swim 70 miles per hour while the carp can swim only 7.6 miles per hour.

15. CAN A FISH FLY?

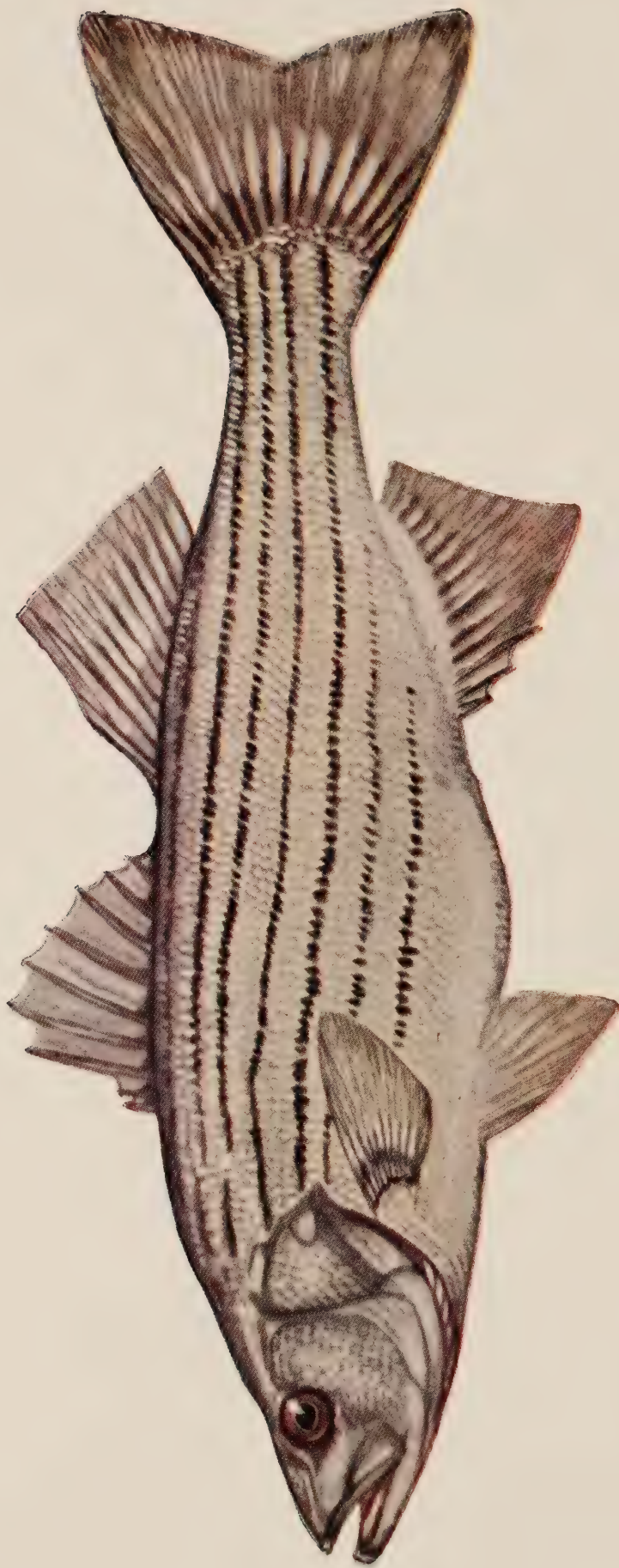
“Flying” is a matter of definition, but most biologists agree that fish do not “fly” in the strict sense of the word. Some, however, have remained airborne for distances as great as one-quarter of a mile. To achieve this feat, the fish surges from the water with as much power as it can muster; some move just above the surface using their tails as a driving force. Various other “flying” fish have modified pectoral fins which are used as “gliding” wings.

16. DOES A FISH SHED ITS SCALES AS IT GROWS?

No. Once formed, the number of scales on a fish never varies. Instead, the scales increase in size as the fish grows larger. These growth periods show as “rings” on the scales and can be counted to determine the fish’s age.

17. DOES IT EVER REALLY “RAIN” FISH?

Yes. Strong winds have “lifted” whole schools of small fish from the ocean or from inland waters and carried them several miles from water before dropping them.



Striped Bass

On the Roanoke River at Weldon, North Carolina operates the only striped bass hatchery in the world. These fish come up the river to here from the ocean to spawn. Millions of fry (hatched eggs) are returned to the rivers along our coast each year to perpetuate this fish and fishing.

Some Common Fish of North Carolina (Game Fish)

The Trout and Salmon Family

Brook trout
Rainbow trout
Brown trout

The Pickerel Family

Eastern chain pickerel
Muskellunge
Redfin Pickerel

The Sea Bass Family

Striped bass
White bass
White perch

The Perch Family

Walleye
Yellow Perch

The Sun Fish and Black Bass Family

Largemouth bass
Smallmouth bass
Warmouth
Robin
Common bluegill
Southeastern bluegill
Pumpkinseed
Shelleracker

Rock bass

Flier

White crappie

Black crappie

Shad and Herring Family

Alewife

Shad

Hickory Shad

Catfish Family

Channel catfish

White catfish

Brown bullhead

Yellow bullhead

Flathead bullhead

Gar Family

Eastern longnose gar

Bowfin Family

Bowfin or Grindle

Sucker Family

White sucker

Redhorse suckers

Chubsucker

The Minnow Family

Carp

Reference Books on fishes:

THE LIFE STORY OF THE FISH

By Brian Curtis

Harcourt, Brace & Co., New York

FIELD BOOK OF FRESH-WATER FISHES OF NORTH AMERICA NORTH OF MEXICO

By Ray Schrenkeisen

G. P. Putnam's Sons (out of print)

New York

AMERICAN FOOD & GAME FISHES

By Jordan and Evermann

Doubleday, Doran & Co., Inc.

Garden City, N. Y.



White Perch

The white perch is found primarily in the estuary of our coastal streams into the sounds. This inland fish is capable of living in the slightly salty or brackish water found at these places.

UPLAND GAME BIRDS

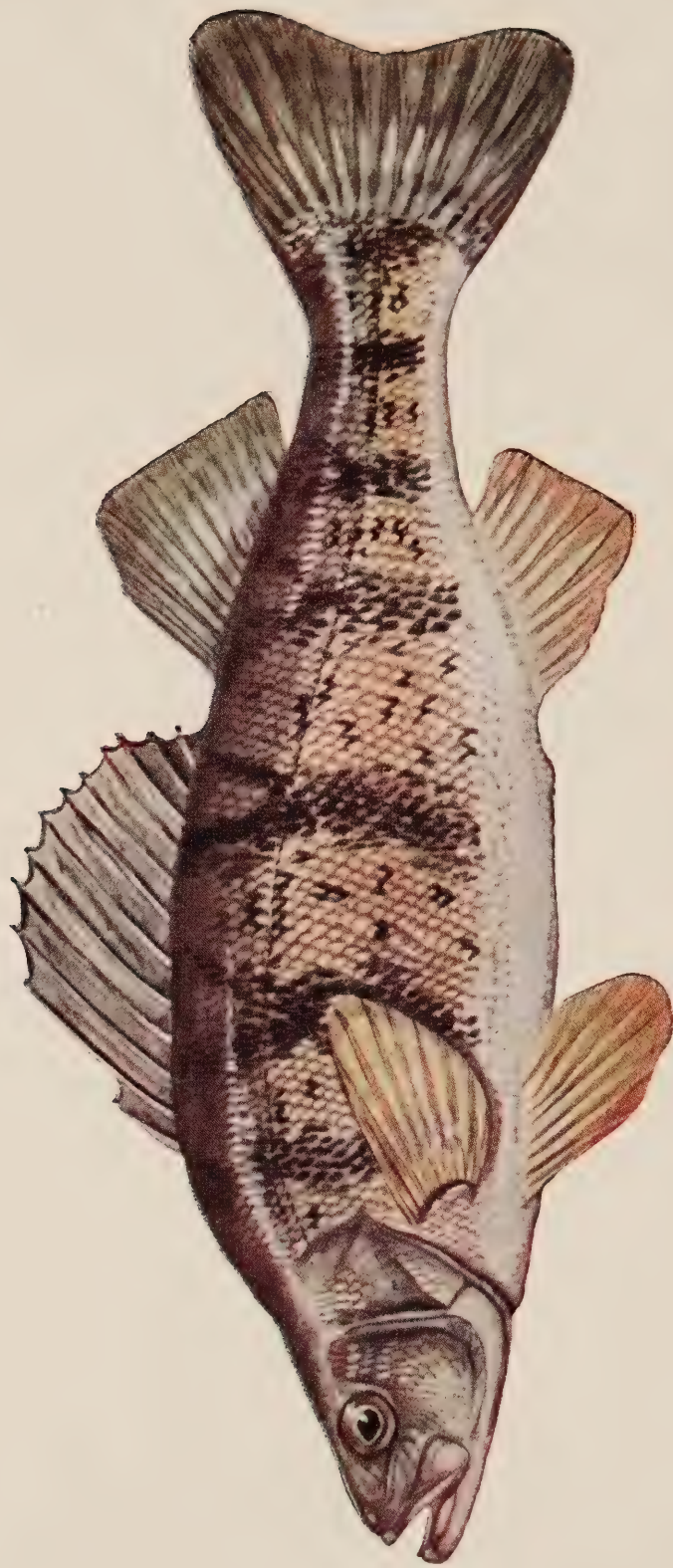


BOBWHITE QUAIL

Range: The quail is distributed throughout the state, but is less abundant in western Carolina. The habitat in central and eastern Carolina is more suitable. Most farms in the state could easily provide for more quail. Doing so would profit the farmer for his efforts.

Characteristics: There are several species of American quail, varying in length from 9½ to 11 inches. The adult bobwhite quail weighs about ½ pound. The plumage is a mixture of mottled brown and buff-gray and white which makes them almost invisible when they lie quietly in fields or woods. Trusting to this concealment, they will squat motionless until one is on the point of stepping on them, and then take wing with an explosive flight.

Habitat: Quail spend the summer and fall on the croplands and pastures and then retreat to the woods only in winter. If any bushy fencerows and hedgerows are available, they serve as a retreat for its nest or for winter shelter, and weed-covered fields are a favorite feeding place. Quail use natural areas of the state such as “bays,” pocosins, savannahs, thickets, brushy regions and grasslands.



Yellow Perch

The yellow perch is becoming widely distributed throughout the lakes and streams of North Carolina. Its original and more favored habitat is the slow moving coastal plain rivers.

Food Habits: Weed seeds form more than half of the total food and include those of all the worst pests of the farm. Among them may be mentioned the seeds of crab, panic and foxtail grasses, sheep sorrel, smartweed, bindweed, lamb's-quarters, pigweeds, corn cockle, chickweed; partridge pea, beggar lice, and ragweed. Acorns, beechnuts, and pine seeds make up about 2.5 per cent of the food, and small wild fruit and berries about 10 per cent. Grain forms scarcely more than a sixth of the food, and most of it is taken during winter and early spring when only waste grain is available. The habit of gleaning after the harvest is beneficial to the farm, for volunteer grain is not desirable, especially where it serves to maintain certain insect and fungus pests.

Animal food, chiefly insects, composes nearly a sixth of the bird's food. While the young are being reared, from June to August, insects are most numerous, and their proportion in the food is about 36 per cent. The variety of insect food is great and includes a number of the most destructive agricultural pests. Among them may be mentioned the potato bug, 12-spotted cucumber beetle, bean leaf beetle, squash lady-bird, wireworms, May beetles, corn billbugs, clover half weevil, army worms, bollworms, cutworms, and cinch bug.

The food habits of the bobwhite are beneficial and the bird should be maintained in numbers on every farm. This is not to say that all shooting should be prohibited, for the bird is very prolific. (But its numbers should not be reduced below the numbers that available nesting sites and range will support.) Only the surplus of the range should be taken leaving an adequate breeding stock for the new year.

The Young: They build nests on the ground in open, brushy fields where they can find suitable cover. The nest, well hidden in thick grass, holds 12 to 18 white eggs. The entire clutch hatches in about one hour's time. The chicks leave the nest together immediately after hatching, but the family keeps together in a covey until the following spring. When scattered they are brought together by the "rallying" call of the parents. At night the birds sleep on the ground in a circle, bodies packed closely together and heads facing outward, so that they can be on the alert for enemies and scatter instantly at an alarm. The white tipped droppings of these night roosts constitute a good "field sign" for the hunter.



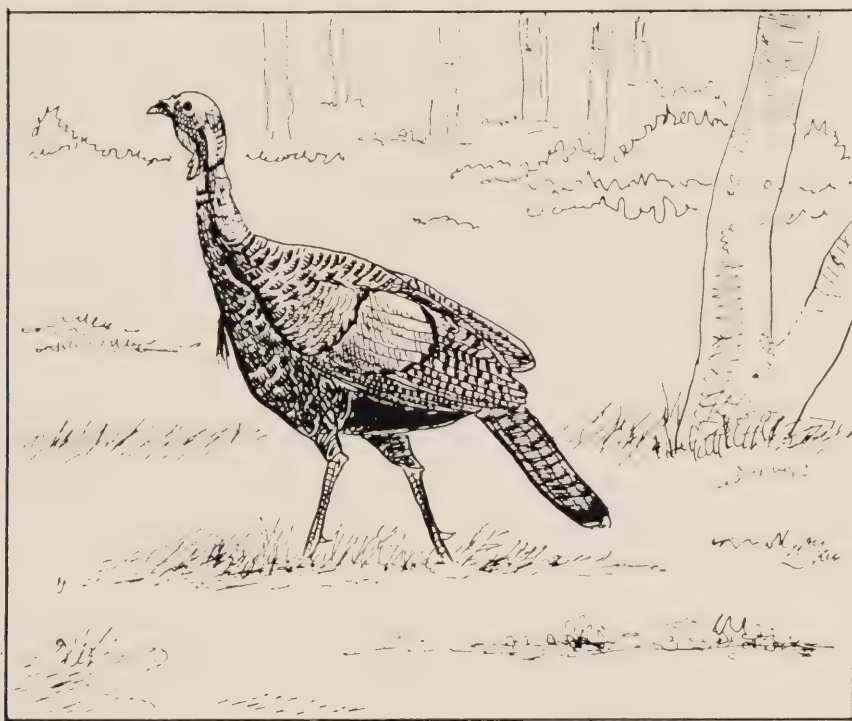
Walleye

It often becomes necessary to draw-down the water in power lake impoundments, and beds of bass and bluegill eggs are exposed and dry out. The walleye has been introduced into such lakes because their eggs are not so affected. The walleye provides additional fishing in power lakes of the Catawba and Yadkin rivers.

Enemies: The common enemies are the self-hunting, stray dogs and cats, foxes, raccoons, skunks, snakes, cotton rats, opossum, Cooper's hawks, sharp-shinned hawks. Other limiting factors are wind, rain, flood, drouth, over-grazed pastures, uncontrolled burning and illegal hunting.

Uses: Important uses of the quail are to furnish sport, recreation and food for the hunter, and they are invaluable because of their beneficial feeding habits on farms. Many consider the quail our most valuable bird.

Management Needs: The greatest need at this time is provision of proper habitat, such as hedgerows, border strips, food patches, legumes, fruits and berries which is the result of proper land use. Proper annual harvest of only the surplus crop and protection from illegal hunting are also important.



WILD TURKEY

Range: The wild turkey has a scattered distribution throughout the state. They are not numerous in any one section.

Characteristics: Ordinarily wild turkeys range from 12 to 16 and even sometimes 20 pounds in weight. It is native only to America. The turkey is related to the pheasant, the grouse, and the quail, but its bare head and neck and its squarish tail place

it in a distinct family. The tail has from 14 to 18 blunt, buff-tipped feathers. These the male (tom or gobbler) spreads fan-wise and raises above his back in courting days. The dark plumage has metallic green, copper, and bronze reflections. The male turkey has a spur on the side of the tarsus, or lower leg, above the toes, and is marked in addition by a pendant tuft of hair-like feathers called the beard in the center of the breast.

Habitat: The turkey in a wild state ranges in extensive woodlands, where it is so shy that one may enter its haunts frequently without once seeing a bird. They roost in trees.

Food Habits: During the day the birds range for food, feeding on grass (seed and blades), acorns, berries, and in the warmer seasons on insects.

The Young: The wild turkey is polygamous, that is, one male will breed with several females. The nest, made by the female, is a hollow scratched in the ground, under cover of a log, dense brush, or other shelter. It lines the nest with grass or a few leaves, and lays from 8 to 15 cream-colored eggs spotted with reddish-brown and lilac. The eggs are covered carefully with leaves and grass when the bird goes off to feed. When the young turkeys hatch after four weeks of incubation, they are frail and in wet seasons many are lost. They range with the mother through the summer and fall. The adult gobblers flock together, mainly apart from their families, during this summer period. When the young can fly, all roost in trees, often varying the sleeping place from night to night. Special care of the young, or poults, is required. They must be kept warm and dry for several weeks. If they are caught in the rain or run in damp grass, they catch cold and die.

Enemies: The common enemies are self-hunting dogs and cats, crows, foxes, raccoons, skunks, snakes, cotton rats, opossums, Cooper's hawks, and sharp-shinned hawks. The most common enemy is man. In most sections man is too eager to hunt them and hens are often killed. As with deer, the law allows only males to be harvested by the hunter. In this way they can furnish sport since most of the males may be considered as "surplus" over the necessary brood stock.

Uses: The turkey is quite a favorite food. It furnishes sport and recreation, and they are valuable as insect eaters.

Management Needs: The most important need is protection, re-

stocking, provision of habitat and food. The present law, permitting the shooting of gobblers only, is one step toward better management in the interest of this kind of game bird.



RUFFED GROUSE

Range: In North Carolina the ruffed grouse is found in the western Appalachian Mountain area at the present time. However, early settlers are reported to have found this bird in the foothills and some distance into the Piedmont.

Characteristics: The ruffed grouse is mostly a ground dwelling bird, similar therefore to the bobwhite quail. It is about 18 inches long and has tufts of shiny black feathers on each side of its neck, which look like a ruff, and so give the bird its name. A crest of feathers adorns the top of its head. The wing spread is 22 to 25 inches, the tail $4\frac{1}{2}$ to $7\frac{1}{2}$ inches, and weight from 16 to 28 ounces.

The common colors in the plumage are brown, gray and red, with touches of purple and dark green in some individuals. Generally the colors of the male birds are more pronounced. The dress of the female is an excellent example of what naturalists call "protective coloration." It is so near the color of her surroundings that, if she remains motionless on her nest among the leaves,

even a keen-eyed fox or hawk will pass her by. The most interesting feet among precocial birds (those whose young are covered with down when hatched and are able to run about) are those of the grouse. Nature provides them with "snowshoes." From each side of each toe a broad, horny comblike fringe grows out; not a web of skin, but rows of horny projections, as a myriad of extra claws. This distributes the weight evenly and helps to keep the birds from sinking into the snow. The male birds are noisy wooers. During the mating season their peculiar love-calls may be heard ringing through the woods. These calls, which take the place of the mating song of singing birds, are dull booming or drumming sounds produced by a rapid beating of the wings.

Habitat: The favorite habitat of ruffed grouse is coniferous woodland, mixed hardwoods, slashings, and moist mountain coves.

Food Habits: Winter food consists of buds and twigs, with fruits and mast taken as available. Spring foods are tender green shoots and insects; the summer diet is composed mainly of fruits in season as they ripen, green leaves, and insects. In fall, buds are again eaten and then acorns, haws, and beechnuts.

The Young: The nest is built on the ground and holds from 10 to 14 eggs. The hen takes entire care of the brood. It takes 23 or 24 days for the eggs to hatch. During the incubation period when it is necessary for the hen to leave, the nest is covered with leaves. When the bird returns to the nest, the eggs are carefully turned. The eggs hatch in a few hours' time and the mother leaves the nest with the young immediately.

Enemies: Predators of the ruffed grouse are foxes, great horned owls, weasles, skunks, Cooper's hawk and sharp-shinned hawks, bobcats, reptiles, crows, and of course, the self-hunting dog. Other limiting factors are wind, rain, flood, drouth, forest fires, and illegal hunting. Disease and parasites are seldom serious.

Uses: The grouse is a favorite game bird, so the most important use of it is to furnish sport, recreation and food for the hunter. From the study of its diet, it can be seen that they are valuable for destroying insects.

Management Needs: The ruffed grouse is so well adapted to its normal habitat that it requires relatively little management.

Where it is desirable to further increase the population creation of clearings and small permanent pastures are beneficial. Dense second growth after heavy logging usually creates ideal food and cover conditions.

FUR BEARERS



MINK

Range: Mink are found throughout North Carolina, being more numerous in the Piedmont and Coastal Plain areas of the state.

Characteristics: The adult mink is about 24 inches long, including a fairly bushy tail which accounts for about one-third of its length. The body is slim and its movements are snake-like. The head appears rather small and the ears are small, rounded, and nearly hidden in the fur. The neck is long and the legs are short. The feet are partially webbed and there are five toes on each foot. The female is slightly smaller than the male and weighs correspondingly less.

The pelt of the natural mink is a rich, dark brown. The fur on the back is darker than that on the other portions and the tail is nearly black. The chin is white and there are usually some

white spots on the chest. The under fur is soft and thick and the longer guard hairs have a lustrous sheen.

The mink is an excellent swimmer and spends much of its time either in the water or along the banks of streams where it finds food.

Habitat: Mink like streams and rivers through wooded areas. The home is usually a hole in the bank of a stream. Often it is a muskrat burrow whose original owner furnished a meal for the new occupants.

Food Habits: The mink is carnivorous and its menu consists of frogs, fish, ducks (especially little ones), and occasionally muskrat. They also eat mice and other small rodents, birds, their eggs, and rabbits.

The Young: Five or six young is the average litter, but it is not unusual for a female to bear as many as 10 or 12. The young are born early in the spring and the mother takes care of them during the summer. They are blind and naked at birth, but they mature a little more rapidly than the common kitten.

Enemies: Of its few enemies, the great horned owl is the most serious.

Uses: Mink are very valuable for their fur, current prices range around \$10 to \$12. Many mink are grown on fur ranches. North Carolina mink furs are the most valuable to the trapper.

Management Needs: Legal protection through the breeding season.

MUSKRAT

Range: Muskrats are found throughout the state, being most abundant in the northern Coastal Plain and Piedmont areas of North Carolina.

Characteristics: The muskrat has a squat, thick body, short legs, and broad hind feet which are partially webbed. The tail is long, narrow, scaly with a sparse covering of hair, and flattened laterally to a thin edge on top and bottom.

The average adult male measures about 23 inches, of which 10 inches are tail, and weighs from 2 to 2½ pounds. The female is slightly smaller. Both sexes are alike in coloration and seasonal change in pelage is not obvious. The fur is composed of



two layers. The under coat is dense, soft, and bluish-gray at the base. The outer coat of long guard hairs is dark brown on the head and back and inclined to be chestnut-brown on the sides. When the pelt is prime, the outer guard hairs are strong and glossy. The under parts of the body are usually lighter in appearance, often grayish on the throat and belly. There is a dark spot on the chin, the tail is dull black, and the lower legs are blackish. The feet are blackish-brown. There is also a black color phase in which the animal appears black above and very dark below.

The muskrat is essentially a water animal. Nature has provided it with webbed hind feet for swimming and a thick oily pelt that repels water like the feathers on a duck. It spends some time on land, of course, but it is in or near the water that it finds both food and shelter.

Habitat: Along the coastal areas the muskrat lives in the salt or brackish marshes and farther inland it is at home in the swamps, lakes, ponds, and streams wherever there is suitable aquatic vegetation. The muskrat prefers a marshy area, be it fresh or salt water, or a quiet sluggish stream. In such places it usually builds a round dome-like house of rushes and other water plants, mixed with mud. Sometimes these houses are quite near the shore, but they may be out in the middle of the pond or marsh.



Owls by night and hawks by day feed on many rodents (rats and mice) that damage our grain, corn and stored crops. They are "living mousetraps." The small creatures that owls and hawks eat breed so rapidly that there is an important job for every owl and hawk to do. Owls and hawks are your friends, protect them.

The tunneled entrance and exit is on or near the bottom and inside the house there is a shelf or bed which is raised above the water level. The number of houses in a given area usually indicates the extent of the muskrat population. Away from marshes and swamps it dens in the banks of streams where the entrance is below the water and the den above water level.

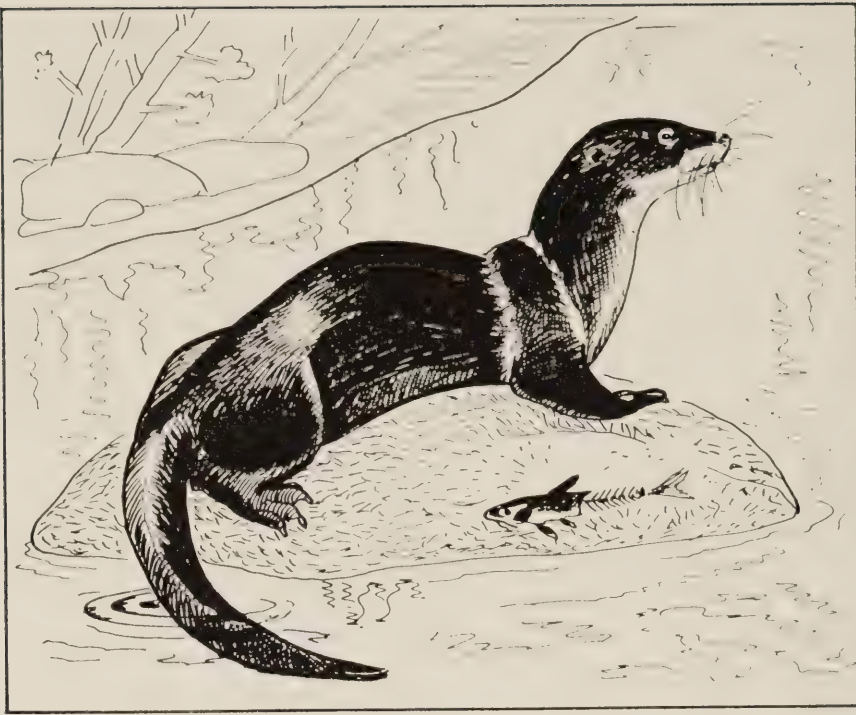
Food Habits: The muskrat eats a wide variety of foods, but aquatic plants furnish the bulk of its diet. In the early spring it feeds on the tender sprouts of cattails and other marsh grasses and the tuberous parts of such plants as sagoes and arrowheads. Rice cut-grass is a favored item and pondweed ranks high on the list. During the winter he survives on roots, stalks, and such vegetation as he can grub from the bottom. In addition to the foregoing, he consumes some animal food such as mussels, salamanders, and fish—the latter not in any quantity, however.

The Young: The female has at least two, generally three, and sometimes more large litters every year. The average number of young in each litter is about four. There is widespread belief that muskrats breed and produce young in their first year, but there is little evidence to support this theory and most naturalists consider it unlikely. They mature rapidly. During the trapping season the larger percentage of the take is made up of animals born that year.

Enemies: Slow-witted and unwary, as compared to most wild creatures, it is the natural prey for many predators, including foxes, hawks, minks, otters, owls, weasels, and snakes. Young muskrats are often taken by snapping turtles, pike, pickerel, and raccoons. Due to the low value of raccoon pelts raccoons have built up to large populations in eastern marshes and recent research evidence indicates that they are a serious predator of young muskrats, digging them out the nesting house.

Uses: The muskrat is very valuable for its fur. Several hundreds of thousands of dollars are paid each year for these pelts in North Carolina.

Management Needs: Habitat improvement and protection. Research now being conducted may bring many now barren areas into muskrat production. Recent research by the Wildlife Resources Commission biologists indicates that coastal marsh populations may be increased by maintaining constant water level with dikes.



OTTER

Range: Otter are found in most sections of the state, more being found in the Coastal Plains and the Piedmont area of North Carolina.

Characteristics: The otter is a large member of the weasel family, with the characteristic long, lithe body and short legs common to that group. The head is fairly broad and flat, the ears are tiny, and the whiskers on the muzzle are long, stiff, and bristly. All four feet end in five toes and are webbed. The soles of the feet are covered with hair. The tail is long, thick, and tapering toward the tip. The pelt of the otter is composed of an inner and outer layer of hair. The former is short, soft, and very dense, while the outer coat consists of long, glossy guard hairs. The upper body is a dark, rich, shiny brown blending to brownish-gray on the mouth and cheeks. The under parts are lighter than the upper and inclined to grayish.

The total length of an adult otter averages about 43 inches, including a 13 to 14 inch tail, and the weight is around 20 pounds. Large specimens weigh up to 25 pounds or more. The otter spends more time in the water than any other member of the weasel tribe. Although an inveterate wanderer, he travels close to lakes or waterways at all times. Otters like to play and they appear to have more fun than any other mammal. They travel in

family groups, play tag, and make slides down mud banks along waterways. They can be trained as pets but have needle sharp teeth which they are not reluctant to use if handled roughly. One of their favorite games is to play follow the leader through the water, alternately diving and surfacing so that the procession of them resembles a huge serpent undulating over the surface of the water.

Habitat: The otter lives along streams and rivers.

Food Habits: The otter is strictly carnivorous. Besides a variety of fish, it feeds on crayfish, small mammals, such as muskrats and young beavers, and occasionally on ducks, poultry and frogs. The otter is a very fast swimmer and has no trouble at all catching fish. The usual habit is to dive, catch a fish, surface with it, and then proceed to eat it with loud crunching sounds.

The Young: These animals are not very prolific. There is but one litter a year and the young vary in number from one to four. Two or three young are about average, however, and five are rare. The home den is generally in the bank of a lake or stream with the entrance below the water line. More rarely it may be in a hollow log close to the water.

Enemies: Aside from man the otter has virtually no enemies to worry about. Smaller predators do not dare attack him and he can easily escape the larger ones.

Uses: The fur is very valuable; it is so long-wearing and serviceable that it is used to grade all other furs in this respect. When dressed it resembles beaver fur and is used in many ways by the fur industry. Only recently has the otter been restored to the list of furbearers to be trapped in North Carolina.

Management Needs: Some people have taken to shooting as a means of harvest. This is not only illegal but also very wasteful since the otter sinks when shot and very few are recovered. Those that are recovered have relatively little fur value because of the shot holes in the pelt.

BEAVER

Range: Beaver are found in the central part of the state, mostly in Richmond and surrounding counties where they were transplanted in 1938 on the Sandhills Wildlife Management Area. They are fully protected.



Characteristics: The beaver belongs to the Order of rodents, and is the largest of that group found in North America. An adult beaver measures from 30 to 45 inches from his nose to the tip of his tail. His weight is from 35 to 70 pounds. His coat is composed of long reddish-brown outer hairs and a soft brownish-gray under fur which keeps him warm and dry. The beaver has very well-developed front teeth, set in strong jaws. These teeth have a very hard layer on the front surface and a softer backing. Since this softer part wears away faster, it always leaves exposed the thin, chisel-edge of the front layer. In addition, the teeth are always growing to make up for over-all wear.

The beaver's hind feet are large and webbed for swimming. His front feet are small and hand-like, not webbed. The second toe on each hind foot has a double claw for combing his fur. Although slow moving on land, the beaver is a splendid diver and swimmer, and can remain under water as long as 11 minutes. The beaver's tail is his most distinctive feature. It is about 10 inches long, broad and flat, and covered with a horny and scaly skin. It serves as a prop when the beaver sits upright and as a rudder and scull when he swims. As a danger signal to others the beaver slaps its tail loudly on the surface of the water.

Habitat: Aquatic by nature, they seldom venture far from water, but a large portion of their food is obtained on land near

their home in streams, lakes, or ponds. They insist on having a home where the water level will remain consistent, or nearly so, throughout the seasons. Unlike the muskrat, it is capable of creating this desirable condition for himself. To insure the proper level, it builds a dam across the stream or at one end of a pond to control the flow. When completed, these dams are many feet thick at the base and so sturdy as to be well-nigh indestructible. In the pond thus created the beavers build their houses, or "lodges," of the same kind of material that was used for the dam.

Food Habits: Beavers feed mainly on the bark of poplar, aspen, willow, and birch trees, and they gather an autumn harvest just as farmers do. When the construction work on their home is done, whole groves of these trees are cut down, brought to the pond, and sunk to the bottom near the lodge for winter food.

The Young: The beaver is monogamous and pairs off for life. Mating usually takes place in late January or the first part of February, and the kits are born in April or May. While the mother is busy with her brood, the male leaves the lodge and either wanders aimlessly about or goes to visit another colony. Sometimes the male digs a bank den and sets up bachelor's quarters for the summer. In the autumn it returns to the lodge, and the family remains together until after the kits are born the following year. The average litter consists of 4 but may be any number from 2 to 6. The young beaver leave the home pond in their second summer and go in search of mates. They may return to the colony mated, but more often they select a new site and begin a colony of their own.

Enemies: Nearly all the larger predators are beaver enemies. Hawks and eagles sometimes swoop down on the young beavers. Except for the otter, of course, the beaver escapes most of his foes by diving into the water. During the winter, although he does not hibernate, he remains more or less inactive within his stout fortress and offers little opportunity for a meal. Since beavers feed chiefly on tree bark, forest fires are most undesirable to them. They just do not like the taste of scorched bark.

Uses: Beavers have been called "the original conservationists." The ponds formed by their dams fill up in the rainy season and give out water slowly during dry weather. Thus, they not only check the erosion caused by swollen streams, but help to keep water in the stream beds all year, watering both crops and stock.

Management Needs: Wise distribution and legal protection.



WEASEL

Range: Weasels are found in all sections of North Carolina. Two kinds are present—the New York, or common weasel, and the Alleghany least weasel.

Characteristics: Weasels are small, ranging from about 8 inches in the rare Alleghany least weasel, to 18 inches long in the larger variety. The body is long and slender. The neck too is long, capped with a small pointed head with shiny eyes. The ears are somewhat large and set close to the skull.

The color ranges from rich brown in summer to snow white in winter for northern or mountain species. The under parts, from chin to flanks, may be a creamy yellow or even white. The feet have well-developed claws, and the teeth are designed for tearing flesh.

It is thought that the Alleghany least weasel is probably the only species in North Carolina which turns white in winter. Perhaps there is too little snowfall here. Weasels are solitary animals, seldom seen together except during the mating season, and when the young are still with the mother.

Weasels have scent glands. The odor of the musk is sickening. It is used apparently as a message or warning to other weasels and not as a defense weapon like the skunk's. Trappers locate weasels by detecting the odor or scenting posts.

Food Habits: The weasel's food consists of every living animal that it can attack and subdue. The menu ranges from tiny insects to wild turkeys. Especially are they fond of blood and brains. Weasels move with remarkable speed and it is with little effort that they obtain their prey.

The Young: Usually there are from 4 to 8 in a litter. They are blind at birth and open their eyes in nine days similar to a house kitten. Sometimes the male helps with rearing the offsprings. The young are very playful. At an early age, they too learn to kill in order to get blood. They live in dens.

Enemies: They have few enemies because of their alertness and swift movements. They are preyed upon perhaps only by hunger-driven carnivores.

Uses: Some weasels are taken by trappers each year while trapping for mink and muskrat, and their small pelts bring higher prices than those of the raccoon, opossum, skunk or fox. While it is bad for weasels to take domestic fowl and birds, and other valuable creatures, it must be remembered that they also take unlimited numbers of harmful, destructive rats and mice.

Management Needs: Where they are too abundant, they should be controlled. The weasels are unprotected in North Carolina.

SKUNK

Range: The striped and spotted skunks are found in North Carolina. The spotted skunk, or civet as it is locally known, has always been restricted to the mountain region, and has shown little change in distribution. The striped skunk has a larger range, and is found in most southern coastal counties, in the Sandhills, as well as mountain and western counties. There are few in the central and Piedmont sections.

Characteristics: Skunks are members of the mink and weasel family. Their most outstanding characteristic is the unusual strong odor produced in the scent glands. The secretion is very acid and the smell will linger for weeks after expulsion. They hardly ever use the secretion except as a last effort to defend themselves.

They are silky, jet black and snowy white. The striped skunk is larger than the spotted, sometimes weighing eight pounds.



Food Habits: Skunks like a variety of food. Their fondness for eggs and flesh make them unpopular with poultrymen. They are also accused of being predators of quail, grouse, and other ground nesting birds. On the credit list, they are recognized for destroying large numbers of rodents, insects, and grubs. Sometimes they break off green tobacco leaves searching for worms.

The Young: Skunks have one large litter per year. Many times there are as many as ten babies for the striped mother to care for. The spotted do not have quite as many. The young are born blind, hairless, and practically helpless. They live in dens but do not like to dig their own. The woodchuck's den is a favorite for them, and they sometimes even take an old den of the fox.

Enemies: Their enemies are few. The great horned owl will kill and eat skunks. Occasionally when larger predators are very hungry they take a skunk. Rabies is not uncommon in skunks.

Uses: The fur is beautiful when processed into garments, and very durable. Skunks make interesting and affectionate pets. A simple bit of surgery can remove the scent glands. As a household pet, they make good mousers. They are exceptionally playful.

Management Needs: Since the only legal protection given to skunks in North Carolina is against poisoning and dynamiting, it can be controlled locally as needs demand.

Some Common Birds of North Carolina

The initial following the bird indicates when most likely to be seen: (w) winter (October-March); (s) summer (March-October); no initial means year round.

Water Birds

(Generally seen at lakes, ponds, streams or seacoast)

Common Loon (w)
Horned Grebe (w)
Pied-Billed Grebe
Brown Pelican (s)
Gannett (w)
Double-crested Cormorant (w)
Water Turkey (s)
Great Blue Heron
American Egret (s)
Snowy Egret (s)
Little Blue Heron (s)
Black-crowned Night Heron (s)
Eastern Green Heron (s)
Yellow-crowned Night Heron (s)
American Bittern
Wood Ibis (s)

Swans-Geese-Ducks

(Generally seen at ponds, lakes, sounds, or seacoast)

Black Brant (w)
American Brant (w)
Whistling Swan (w)
Canada Goose (w)
Greater Snow Goose (w)
Mallard (w)
Black Duck (w)
Gadwall (w)
Baldpate (w)
Pintail (w)
Green-winged Teal (w)
Blue-winged Teal (w)
Shoveller (w)
Wood Duck
Redhead (w)
Ring-necked Duck (w)
Canvasback (w)
Greater Scaup (w)
Lesser Scaup (w)
American Golden-eye (w)
Bufflehead (w)
Old-squaw (w)
White-winged Scoter (w)
Ruddy Duck (w)
Hooded Merganser (w)
American Merganser (w)
Redbreasted Merganser (w)

Vultures and Hawks

Duck Hawk
Turkey Vulture
Black Vulture
Sharp-shinned Hawk
Cooper's Hawk
Red-tailed Hawk
Red-shouldered Hawk
Broad-winged Hawk (s)
Rough-legged Hawk (w)
Bald Eagle
Marsh Hawk
Osprey (s)
Sparrow Hawk

Gallinaceous Birds

(In woods and idle fields)
Ruffed Grouse
Bobwhite Quail
Wild Turkey

Rails and Coots

(Generally in marshes)
King Rail (w)
Clapper Rail
Virginia Rail
Black Rail
Sora
Florida Gallinule
Coot (w)

Shore Birds

(Along the Atlantic Coast and inland waterways)
Oyster Catcher
Semi-palmated Plover (w)
Killdeer (inland)
Black-bellied Plover (w)
Ruddy Turnstone (w)
Woodcock (inland)
Wilson's Snipe (inland)
Hudsonian Curlew (w)
Spotted Sandpiper (s)
Solitary Sandpiper (w)
Willet (w)
Least Sandpiper (w)
Red-backed Sandpiper (w)
Sanderling (w)
Black Skimmer

Gulls-Terns

(Usually on seacoast, may be blown inland)

Herring Gull (w)
Ring-billed Gull (w)
Laughing Gull
Bonaparte's Gull (w)
Common Tern
Royal Tern (s)
Caspian Tern (s)
Black Tern (s)

Doves

Mourning Dove

Cuckoos

Yellow-billed Cuckoo (s)
Black-billed Cuckoo (s)

Owls

(More often heard than seen)
Screech Owl
Great Horned Owl
Barred Owl
Long-eared Owl
Saw-whet Owl (w)
Barn Owl

Goatsuckers

(More often heard than seen)
Chuck-will's Widow (s)
Whip-poor-will (s)
Nighthawk (s)

Swifts

Chimney Swift (s)

Hummingbirds

Ruby-throated Hummingbird (s)

Kingfishers

Belted Kingfisher

Woodpeckers

(Generally in woodlots and forests)
Flicker
Pileated Woodpecker
Red-bellied Woodpecker
Red-headed Woodpecker
Yellow-bellied Sapsucker
Hairy Woodpecker (w)
Downy Woodpecker
Red-cockaded Woodpecker (s)

Flycatchers

(Generally in woods and along streams)
Kingbird
Crested Flycatcher (s)
Phoebe
Pewee (s)

Swallows

(Generally over water areas and pastures)

Tree Swallow
Bank Swallow (s)
Rough-winged Swallow (s)
Barn Swallow (s)
Cliff Swallow (s)
Purple Martin (s)

Crows and Jays

Bluejay
American Crow
Fish Crow
Raven

Chickadees, Titmice, Nuthatches

Carolina Chickadee
Tufted Titmouse
White-breasted Nuthatch
Brown-headed Nuthatch

Creepers

Brown Creeper

Wrens

House Wren (s)
Winter Wren (w)
Carolina Wren
Marsh Wren

Mimicrs

Mockingbird
Catbird
Brown Thrasher

Thrushes

Robin
Wood Thrush (s)
Hermit Thrush (w)
Veery (s)
Bluebird

Gnatcatchers and Kinglets

Blue-gray Gnatcatcher (s)
Golden-crowned Kinglet (w)
Ruby-crowned Kinglet (w)

Pipits

American Pipit (w)

Waxwings

Cedar Waxwing (w)

Shrikes

Loggerhead Shrike

Starlings

Starling

Vireos

(Generally seen in woods and along streams)

White-eyed Vireo (s)

Yellow-throated Vireo

Blue-headed Vireo

Red-eyed Vireo (s)

Warbling Vireo (s)

Warblers

(Generally seen in woods, fields, and along streams)

Black-white Warbler (s)

Prothonotary Warbler (s)

Worm-eating Warbler (s)

Parula Warbler (s)

Yellow Warbler (s)

Magnolia Warbler (s)

Cape May Warbler (s)

Black-throated Blue Warbler (s)

Myrtle Warbler (w)

Blackburnian Warbler (s)

Yellow-throated Warbler (s)

Chestnut-sided Warbler (s)

Black-poll Warbler (s)

Pine Warbler

Prairie Warbler (s)

Palm Warbler

Ovenbird (s)

Water Thrush (s)

Kentucky Warbler (s)

Yellow Throat

Yellow-breasted Chat (s)

Hooded Warbler (s)

Redstart

Weaver Finch

English Sparrow

Blackbirds

(Generally seen in farm areas)

Bobolink (s)

Meadowlark

Redwing

Orchard Oriole (s)

Baltimore Oriole (s)

Rusty Blackbird

Boat-tail Grackle (s)

Purple Grackle (s)

Cowbird (s)

Tanagers

(Found generally in woodlands)

Summer Tanager (s)

Scarlet Tanager (s)

Grosbeaks, Sparrows, Finches

Cardinal

Rose-breasted Grosbeak (s)

Blue Grosbeak (s)

Indigo Bunting (s)

Painted Bunting (s)

Purple Finch (s)

Pine Siskin (w)

Goldfinch

Towhee

Savannah Sparrow

Grasshopper Sparrow (s)

Vesper Sparrow (w)

Pine-woods Sparrow (s)

Junco

Chipping Sparrow (s)

Field Sparrow

White-throated Sparrow (w)

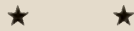
Fox Sparrow (w)

Swamp Sparrow

Song Sparrow

MORE INFORMATION ABOUT
THESE BIRDS MAY BE FOUND
IN:

BIRDS OF NORTH CAROLINA
by Pearson, Brimley & Brimley, State
Museum, Raleigh, North Carolina and
A FIELD GUIDE TO THE BIRDS
by Roger Tory Peterson, Houghton-
Mifflin Company, Boston, Massachu-
setts.



The Mammals of North Carolina (Family and Species)

Pouched Marsupials

1. Common Opossum

Moles

1. Star-Nosed Mole
2. Brewers Mole
3. Common Mole

Shrews

1. Smoke Shrew

2. Common Shrew

3. Bachmans Shrew

4. Fishers Shrew

5. Virginia Pigmy Shrew

6. Carolina Mole Shrew

7. Dismal Swamp Mole Shrew

8. Common Mole Shrew

9. Little Mole Shrew

Bats

1. Little Brown Bat
2. Say's Bat
3. Social Bat
4. Big Brown Bat
5. Silver-Black Bat
6. Georgia Bat
7. Hoary Bat
8. Red Bat
9. Twilight Bat
10. Big-eared Bat

Seals

1. Harbor Seal

Bears

1. Black Bear

Raccoons

1. Common Raccoon

Weasels and Kin

1. Mink
2. Common or New York Weasel
3. Alleghany Least Weasel
4. American Otter
5. Alleghany Spotted Skunk
6. Southern Skunk

Dogs, Wolves, Foxes

1. Gray, or Timber Wolf
(doubtful)
2. Red Fox
3. Gray Fox

Cats

1. American Panther or Cougar
(rare)
2. American Wildcat

Beavers

1. American Beaver (introduced)

Squirrels and Kin

1. Woodchuck or Ground Hog
2. Chipmunk
3. Red Squirrel
4. Gray or Cat Squirrel
5. Fox Squirrel
6. Mearns Flying Squirrel
7. Common Flying Squirrel

Jumping Mice

1. Common Jumping Mouse
2. Meadow Jumping Mouse

Rats and Mice

1. Common Harvest Mouse
2. Golden or Red Mouse
3. Cloudland Deer Mouse

4. Common Deer Mouse
5. Cotton Mouse
6. Rice or Rice-field Rat
7. Cotton Rat
8. Florida Wood Rat
9. Coopers Lemming Mouse
10. Carolina Red-Backed Mouse
11. Rock Vole
12. Meadow Mouse
13. Pine Mouse
14. Muskrat

Introduced Rats and Mice

1. House Mouse
2. Wharf or Norway Rat
3. Roof Rat
4. Black Rat
5. Nutria

Rabbits

1. Virginia Varying Hare
2. Cottontail Rabbit
3. New England Cottontail
4. Marsh Rabbit
5. Water Rabbit or Canecutter

Hogs

1. European Wild Boar

Deer

1. Wapati or Elk (rare)
2. Virginia or White-Tail Deer

Cattle

1. American Bison or Buffalo
(extinct in North Carolina)

Sirena, Sea Cow

1. Florida Manatee or Sea Cow

Dolphins (Porpoises)

1. Bottle-Nosed Dolphin
2. Common Dolphin
3. Spotted Dolphin
4. Blackfish or Pilot Whale
5. Southern Blackfish
6. Harbor Porpoise
7. False Killer Whale
8. Killer Whale

Beaked Whales

1. True's Beaked Whale

Sperm Whales

1. Sperm Whale or Cachalot
2. Pigmy Sperm Whale

Whalebone Whales

1. Atlantic Right Whale
2. Finback Whale



Contact with nature has inspired some of the greatest contributions to human welfare.
Wise use and enjoyment of our great heritage is Conservation.

MISCELLANEOUS SPECIES

The preceding game mammals, birds, and fish described and identified are the major wildlife species of the state, but the myriad of animal life remaining is basically important. In most instances these other forms of animal life constitute the food diet of game species. Being that important, some consideration should be given to the kinds and association of these other forms.

Many of the furbearers course the waterways of the state to seek food and lodging. Here are taken crayfish, fresh-water mussels, snails, frogs, salamanders, and small fish. The upland game mammals take mice, rats and other rodents, birds and their eggs, insects, and some lizards. The big game mammals are largely vegetarians, but occasionally a bear will feed on livestock. The game bird feed primarily on vegetation, but when young are to be fed soon after hatching, the diet is mainly insects and worms, and frequently insects during adulthood.

From such associations as mentioned it may be wise to mention food chains to emphasize the interrelationship and interdependence of animal life for its mutual benefit.

FOX AND HAWKS → RODENTS → QUAIL

(Fox and hawks feed on rodents which break up quail nests. Rodents are "buffers.")

TINY AQUATIC PLANTS AND ANIMALS → AQUATIC
INSECTS → SMALL FISH → LARGE FISH
→ MAN

(The tiny aquatic plants and animals are fed upon by aquatic insects which are a source of food for small fish that may be food for larger fish caught and eaten by man).

POTATO WORMS → POTATO
SKUNK → GRASSHOPPERS → WHEAT

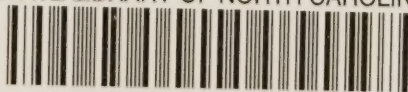
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CONSERVATION PLEDGE

I GIVE MY
PLEDGE AS AN AMERICAN
TO SAVE AND FAITHFULLY
TO DEFEND FROM WASTE
THE NATURAL RESOURCES OF
MY COUNTRY—ITS SOIL AND
MINERALS, ITS FORESTS,
WATERS, AND
WILDLIFE.



PROTECT NORTH CAROLINA WILDLIFE

BY
PREVENTING FOREST FIRES
AND
REPORTING GAME LAW
VIOLATIONS